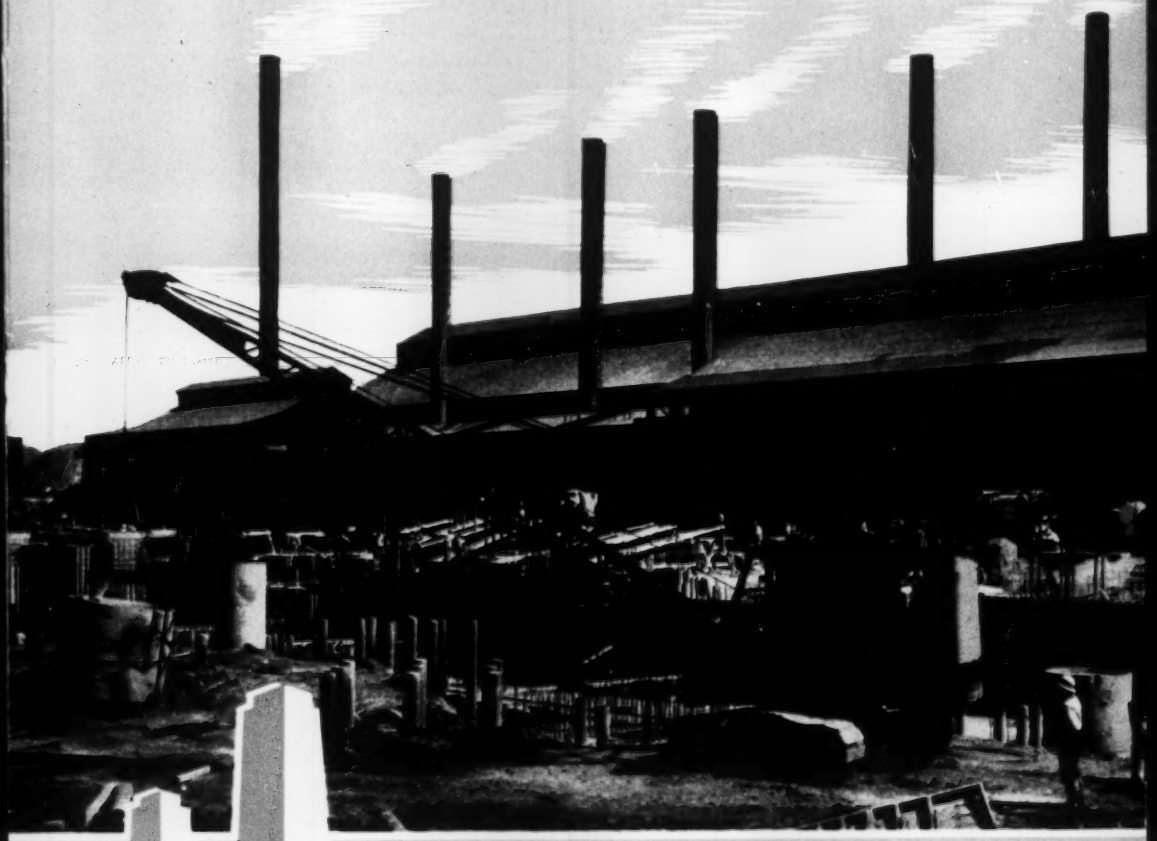
MARCH 3, 1952

STEEL

THE WEEKLY MAGAZINE OF METALWORKING



SPECIAL REPORT ON:

BUILD-UP IN STEEL

A point-by-point list of expansions being made or projected by the iron and steel industry. AND the first public report plant-by-plant on current steel ingot and blast furnace capacities—on page 51

CONTENTS — PAGE 5

NO! you can't use my name !

this space was reserved for a customer testimonial

When we asked for a customer testimonial, Mr. X said, "No! You Can't Use My Name! I don't want my competition to learn of the bonanza of work I can accomplish with the Quickwork Stamping Trimmer."

Although we must respect Mr. X's confidence, we are willing to share, with you, the secrets of the Quickwork-Whiting Stamping Trimmer. It is inexpensive, easy to operate, and extremely versatile. It beads, forms, trims, with dependable accuracy, almost any kind of sheet metal stamping on a single plane.

The Quickwork Stamping Trimmer offers you a means of expediting the finishing of your metal stampings. It eliminates the need for expensive trimming dies and opens up new time and metal-saving short-cuts.

New Techniques Possible

With special sets of rolls designed for special requirements, the Quickwork Stamping Trimmer multiplies its range of usefulness. Opens up new time and metal-saving short-cuts in trimming, beading, and forming.

Takes the Place of 6 Machines

A Quickwork-Whiting Rotary Shear with attachments does the work of six machines. Fast — accurate — tested in service. Models available to handle up to 1" mild steel. Write for Bulletin QW-100R.

QUICKWORK DIVISION

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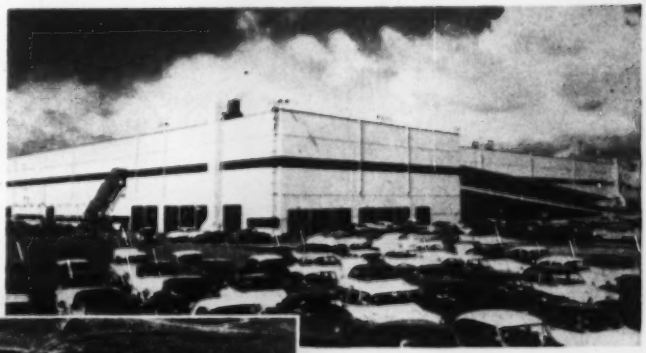
HARVEY, ILLINOIS

*Reg. U. S. Pat. Off.

More Industrial Plants with
STEELWORK by BETHLEHEM PACIFIC

GENERAL MOTORS — Sparkling new automobiles for the Western market are rolling from this General Motors Corporation building. It is a recent addition to the Southern California Buick, Oldsmobile, Pontiac assembly plant in South Gate.

The 2700 tons of structural steel for this building were fabricated and erected by Bethlehem Pacific. The contractors and architects were the Argonaut Realty Division of General Motors.

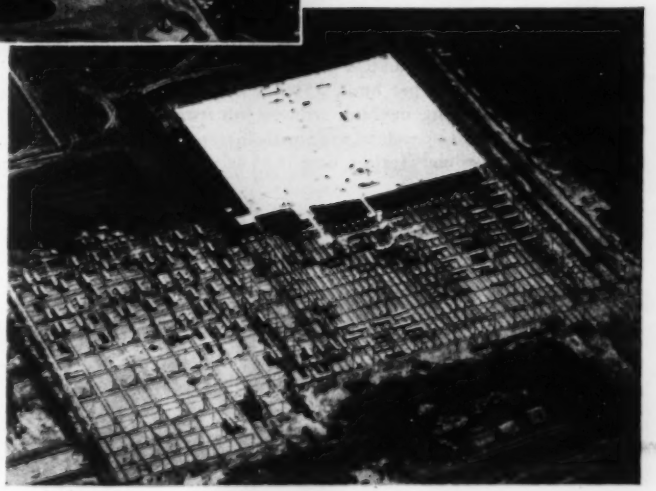


LEVER BROTHERS — The new Los Angeles plant of Lever Brothers Company is one of the largest soap-producing plants in the world. It consists of six major buildings, considerable outdoor processing equipment, and a large tank farm, all located on a 30-acre tract.

Besides rolling and fabricating 2000 tons of reinforcing bars, Bethlehem Pacific also fabricated and erected 1200 tons of structural steel for the buildings. Contractors were the Bechtel Corporation. Architects were Welton Becket and Associates. Consulting structural engineer was Paul Jeffers.

AMERICAN CAN — From this building will come an endless stream of containers for the Western packers and refiners. It will provide manufacturing, warehousing, and office space for the American Can Company in Stockton. One story in height, it covers five acres and contains 900 tons of structural steel.

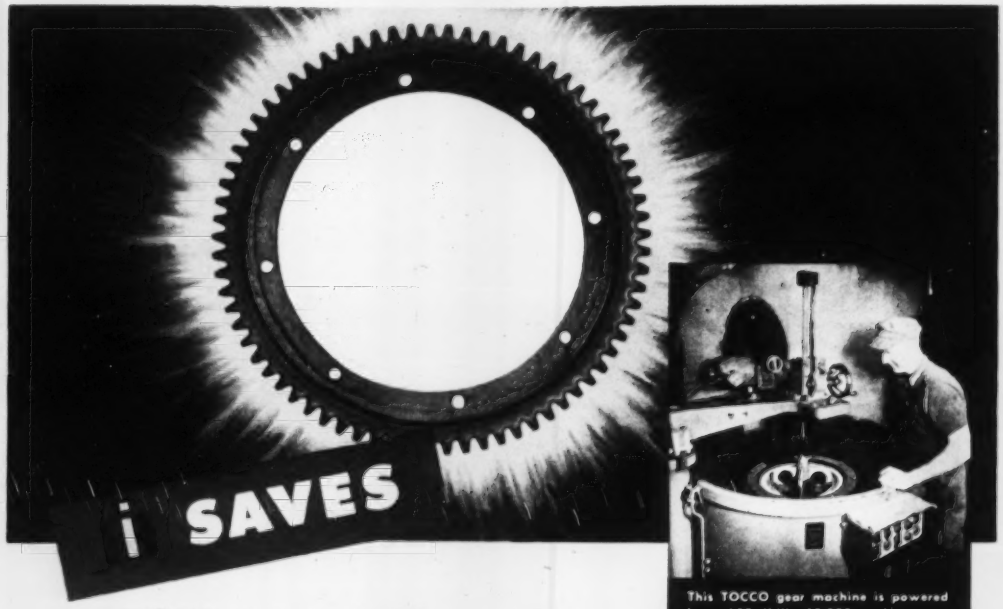
Bethlehem Pacific handled the steel construction. Larsen and Larsen were the general contractors. Donald R. Warren was the architect and engineer.



Bethlehem Pacific Coast Steel Corporation

Fabricating Works: Los Angeles, Alameda, South San Francisco, Seattle

BETHLEHEM STEEL



This TOCCO gear machine is powered by a 150 K.W., 10,000 cycle motor-generator set. Photo—courtesy of International Harvester Company

$82,507 Per Year

with TOCCO* Induction Hardening

GEARS, shafts, pins, wheels, tubes and bars—almost any size or shape of part—or any metal, too—is adaptable to TOCCO hardening, brazing, annealing or heating for forging.

PRODUCTION UP—Engineers at the Milwaukee Works of International Harvester Company have adopted TOCCO for hardening final drive gears for famous International Harvester farm tractors. TOCCO increases production on the gear shown here from 14 to 35 per hour, 250% faster than conventional heating method, reduces job from a 3 shift to 2 shift operation, even with increased production schedule. Heating time is 35 seconds; oil quench, 60 seconds.

COSTS DOWN—TOCCO cuts cost—saves $82,507 per year on application shown above. TOCCO makes possible use of C-1050 A.R.R. steel instead of expensive A-8645-H alloy steel previously required. TOCCO also eliminates shot-blast, formerly needed to remove scale, and extra machining operations that used to be necessary to compensate for distortion.

Gear shown is 18½" O.D., width of face is 2", weight 34 pounds, 73 teeth. Hardness obtained is 55-66 R.C., using 140 K.W. of 10,000 cycle power.

●

Our Engineers can probably find applications in your plant where TOCCO can increase output and reduce unit costs.

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NEW **FREE** BULLETIN

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Please send copy of "Typical Results of TOCCO Induction Heating for Forming and Forging".

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It has a "Mathematical Eye" for Distance

Added Evidence that—

Everyone Can Count on VEEDER-ROOT

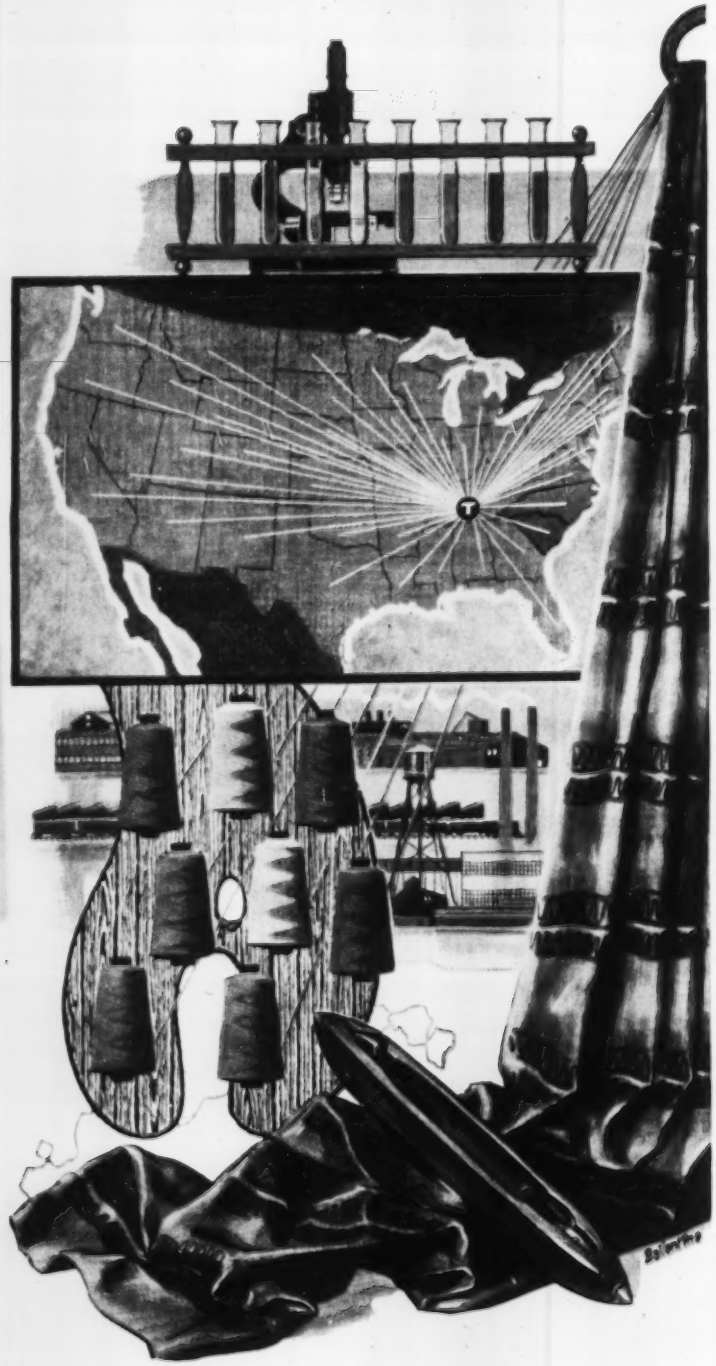
Here's still another good soldier, on a highly special assignment. With contact assembly, it counts miles and yards, when used in conjunction with other equipment. And it also makes contacts on *predetermined* readings . . . *direct* readings that need no translation.

Now, as the counting process comes to be counted as more and more indispensable to all types of defense materiel, what might we do . . . *especially for you?* Just say when you'd like to get together...*and start figuring.*

VEEDER-ROOT INCORPORATED
"The Name That Counts"
HARTFORD 2, CONN.
Chicago 6, Ill. • Greenville, S. C.
Montreal 2, Canada • Dundee, Scotland
Offices and agents in principal cities

"Counts Everything on Earth"

THERE'S A TOUCH OF TENNESSEE IN CAROLINA TEXTILES



The people of the Carolinas were making fine textiles even before the Constitution was signed. The fame of Carolina Textiles has grown with the Country and so has Tennessee's part in this most important industry. Today, Tennessee supplies Acetic Acid for bleaching and treating fabrics; Benzaldehyde for dye manufacture; Pig Iron and Ferro-alloys for machinery—not only to the Carolinas but to the other states producing textiles. And for cotton, the principal raw material, Tennessee supplies Sulphate of Ammonia for mixed fertilizers and Benzene Hexachloride for dust and spray formulations to protect the crops from the Boll Weevil.

Key industries in every state depend upon Tennessee for elements essential to their production processes. That's why Tennessee is known from Coast to Coast as an industry serving all industry.

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PRODUCTS & CHEMICAL
Corporation
NASHVILLE, TENNESSEE

Producers of: FUELS • METALLURGICAL PRODUCTS • TENSULATE BUILDING PRODUCTS • AROMATIC CHEMICALS WOOD CHEMICALS • AGRICULTURAL CHEMICALS

STEEL

The Weekly Magazine of Metalworking

VOL. 130 NO. 9 MARCH 3, 1952

THIS WEEK IN METALWORKING

NEWS

Behind the Scenes 6
Letters to the Editors 12
Metalworking Outlook 39
As the Editor Views the News 43
The Metalworking Contract Summary 55
Checklist on Controls 55
Windows of Washington 56
Mirrors of Motordom 61
The Business Trend 65
Men of Industry 69
Obituaries 72

PRODUCTION-ENGINEERING

Production-Engineering News at a Glance 75

Melting and casting rare metals presents no problem if close attention is paid to precision techniques . . .

Rare Metals Require Precision Furnacing 76

Are you using imaginative maintenance? It's a big factor in keeping production flowing smoothly . . .

Machine Maintenance: Production Can't Wait 79

Production control system brings order where chaos formerly existed for steel partition manufacturer . . .

Flexibility—Key to Production Control System 81

Scouring steel strip with coated abrasive paper produces variety of finishes, cleans surface evenly . . .

Smooth Finish for Strip 82

Bigger output with less coke results when Soviets convert blast furnaces to high pressure blowing . . .

Nine Stacks Operate on Elevated Top Pressure 84

Iron production drop over long period is lower because furnace lining holds up better under high pressure . . .

Progress in Steelmaking
High Top Pressures Afford Smoother Operation 89
Calendar of Meetings 134
New Products and Equipment 139
Helpful Literature 155

MARKETS

The Market Outlook 159
Metal Prices and Composites 160
Nonferrous Metals 171
Metalworking Briefs 181

Editorial and Business Staff—Page 10. Advertising Index—Page 188. Editorial index available semiannually. STEEL also is indexed by Engineering Index Inc., 29 West 39th St., New York 18.

Published every Monday by the Penton Publishing Company, Penton Building, Cleveland 13, Ohio. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year $10; two years $15; all other countries, one year $20. Single copies (current issues) 50 cents. Metalworking Yearbook issue $2.00. Entered as second class matter at the postoffice in Cleveland, under the Act of March 3, 1879.

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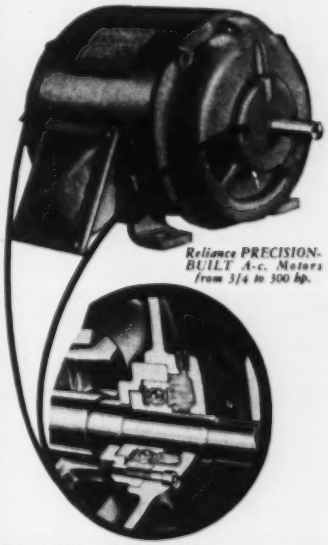
Pre-lubricated Bearing Design

in

RELIANCE MOTORS

provides

more operating hours without re-lubrication!



Reliance PRECISION-BUILT A-c. Motors from 3/4 to 300 hp.

Reliance Bearing Design, including extra-large grease reservoir, provides longer bearing life.

Original, factory lubrication permits more operating hours without re-lubrication than that of any other pre-lubricated bearing. From a larger grease reservoir than provided with any standard bearing, Reliance double-shielded bearings automatically take on new grease as needed. And the Reliance design not only *keeps* bearings lubricated, but makes it *impossible to overgrease* a Reliance Motor. Get the convenient chart on which you can check these and other features which combine to give you 15 important advantages in the Reliance Pre-lubricated Bearing Design . . . write today for Bulletin B-2201.

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ELECTRIC AND ENGINEERING CO.

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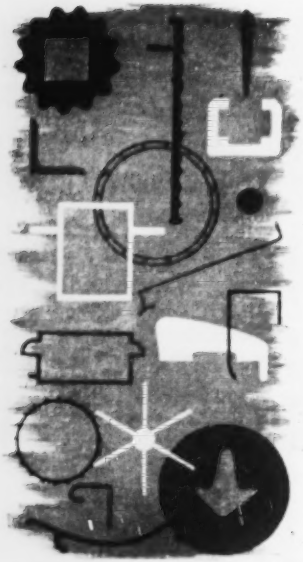
"All Motors are NOT Alike"



A profile of WERNER Aluminum Services

To the prime contractor who needs help *now*, Werner's extensive manufacturing and production facilities invite careful investigation as your dependable production source.

Two strategically located Werner high-capacity plants are currently servicing nationally known prime contractors*.

A highly skilled, personalized service; direct teletype lines, and excellent forwarding facilities will expedite your order for:

ALUMINUM EXTRUSIONS
ROLL-FORMED SHAPES
Aluminum • Stainless Steel
Brass • Zinc • Copper

Your inquiry will bring you specific information concerning Werner facilities for: Extrusion and Roll-forming and, *secondary operations*: Bending • Drilling • Punching • Cutting • Counter Sinking • Welding • Riveting • Fabrication. **FOR ESTIMATING:** *Please submit drawings and specifications.*

* Names on request

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Behind the Scenes...

Coming Up

Hold your hat for next week's issue. It's a special job put out in conjunction with the American Society of Tool Engineers' exposition in Chicago Mar. 17-21.

In the book will be a checklist on advancements in tooling, a story on the role of the tool engineer, an article on palletizing during machining, a discussion of a new method which permits selecting the most suitable press for a given die design, plus the ASTE program and a list of exhibitors.

The Old Oil

Some 17,350 long tons of sperm oil arrived in the U. S. last month. Behind that shipment is proof that a dying romance can be revived.

Sperm oil comes from sperm whales and the need for the product, garnered as the result of romantic whaling expeditions, almost died with the demise of the last major market—whale oil signal lamps on railroads. Research by Archer-Daniels-Midland Co., Minneapolis, helped revive sperm whaling. ADM's Chemical Products Division discovered that sperm oil is essential for such mechanisms as automatic shifts for automobiles. Only sperm oil refuses to stiffen up when cold, or to thin out dangerously when heated. Other uses include mixtures for cutting oils and high pressure lubrication (because of its high film strength), tanning leather and textile processing.

As the result of its research, ADM is the world's largest processor of sperm oil and uses well over half this season's catch, this year utilizing the oil from 3066 sperm whales. ADM's sperm oil comes from Spermaceti Whaling Co.'s *Anglo Norse*, a floating whaling factory.

New Man

A new face upstairs belongs to Robert F. Huber. He joins STEEL as an assistant editor and will specialize in engineering and production news.

Bob attended high school in Mansfield, O., and while in the Navy studied at Harvard, Cornell and Baldwin-Wallace, eventually emerging as a communications officer. He graduated from Denison University in 1949. His industrial experience was gained at Westinghouse Electric Corp. and at Warner & Swasey Co. where he received special apprentice training and carried out special laboratory assignments.

Torn Up

If in the coming weeks STEEL editors come up with some unusually passionate articles on construction, don't be surprised. Right now they don't like construction because their offices are all torn up for a complete modernization job.

Most of the old office partitions have come down and at the moment nearly all the editors are functioning in one huge bullpen. Some of those tricky movable office partitions are coming in, once the ceilings get soundproofed and floors asphalt tiled.

On order is a lot of new metal furniture. We've put in a requisition for some of the old equipment to replace, at long last, our orange crates and saw horses we have been using for furniture.

Puzzle Corner

In the problem of Feb. 18, the hunter packs his 1.7-yard gun in a flat square case 1 yard on a side. The diagonal length is 1.73 yards. First in with that answer were Walter Wilson of Ritter Co. Inc., C. E. Blass of Talon Inc., Lewis D. Rice of Timken Roller Bearing Co. and H. C. Osborne of Racine, Wis. George Crowder of Canadian Westinghouse Co. Ltd. also gave that answer, but points out that "railroads naturally would point out that the fourth dimension is 5.2 feet and would not be acceptable." But there's a solution even here: "If we go into the fourth dimension we don't need a box. Just thrown the gun into the fourth dimension and at the end of the journey take it out again."

Here's this week's problem: A certain plant reproduces by doubling each day the area it covers. If starting with one plant, a certain area is covered in 30 days, how long would it take two plants to cover the same area?

Shrdlu

(Metalworking Outlook—Page 39)

odern day whippletree . . .

HARNESSING HORSEPOWER TODAY CALLS FOR HIGH STRENGTH SHARON* STEELS

Back before the automotive age it required a good, stout whippletree to transfer a single horsepower to the wheels of a carriage. Today we "harness up" 150 horsepower — transferring this energy through a single, slim drive shaft.

This requires good steel. Steel that will withstand a fibre stress of more than 38,000 psi, while spinning at speeds up to 5,000 rpm. Steel with a uniform flatness that will enable fabricators to easily produce a shaft of balanced wall thickness. Steel cold worked to a 95 maximum, with a minimum Rockwell of 80B, and a permissible elongation of but 7 per cent.

Sharon has long been a prime supplier of steels for drive shafts, because making precision steel in production quantities has, over the years, become a Sharon-steel habit.

***Specialists in STAINLESS, ALLOY, COLD ROLLED and COATED Strip Steels.**

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Sharon, Pennsylvania

DISTRICT SALES OFFICES: CHICAGO, ILL., CINCINNATI, O., CLEVELAND, O., DAYTON, O., DETROIT, MICH., INDIANAPOLIS, IND., MILWAUKEE, WIS., NEW YORK, N. Y., PHILADELPHIA, PENNA., ROCHESTER, N. Y., LOS ANGELES, CALIF., SAN FRANCISCO, CALIF., MONTREAL, QUE., TORONTO, ONT.

For information on Titanium Developments contact Mallory-Sharon Titanium Corp., Niles, Ohio

SHARONSTEEL

LINDE'S News of Metalworking

Sigma Welding...

A Process with Outstanding Promise

Recently, the country's biggest tank car manufacturer received the largest order for aluminum tank cars ever issued — ninety-eight tank cars on a single order. This order was obtained only because of the development of a fully automatic welding process . . . shielded inert gas metal arc welding — sigma welding.

This welding process has made double-vee butt welds at 5 in. per min. in 1-in. material. Structural welds have been made at 48 in. per min. in ¼ in. plate, and as high as 200 in. per min. on $\frac{1}{16}$ in. material.

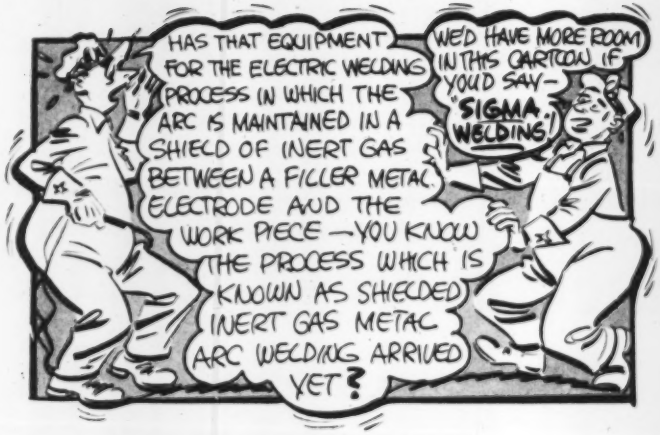
Prior to the development of sigma welding, fabricating aluminum tank cars was a slow hand process. In order to weld the heavy plates used in making the cars, as many as six passes were required.

With an automatic sigma welding setup, X-ray quality welds in the ¼ to 1¼ in. thick aluminum plates are made at speeds of from 6 to 15 in. per minute. And only 2 passes, one inside and one outside, are required to get perfect penetration. High current densities used in sigma welding result in narrow welds with deep penetration.

Sigma welding is fast becoming an important fusion welding method. It has not only replaced many other welding methods, but has permitted fabrications hitherto impracticable for welding.

Just recently, a metalworker adopted this process for welding an aluminum-bronze valve seat to a mild steel tube . . . sigma welding proved to be the only practical method he could use for this work.

Another shop built their first *aluminum tank using sigma welding* . . . The large tank was finished so quickly — work progressed without stopping — that the shop will replace all other welding methods with sigma welding. Excellent welds *requiring little finishing* were obtained in the ¼ in. aluminum plates.


HAS THAT EQUIPMENT FOR THE ELECTRIC WELDING PROCESS IN WHICH THE ARC IS MAINTAINED IN A SHIELD OF INERT GAS BETWEEN A FILLER METAL ELECTRODE AND THE WORK PIECE — YOU KNOW THE PROCESS WHICH IS KNOWN AS SHIELDED INERT GAS METAL ARC WELDING ARRIVED YET?
WE'D HAVE MORE ROOM IN THIS CARTOON IF YOU'D SAY — "SIGMA WELDING!"

New Processes Need New Names

The cartoon shows just about the way it started . . . Shielded inert gas metal arc welding was quite a mouthful to say when describing or referring to the process. It also required a lot of space in written material.

Then someone said sigma welding. It was easier to say.

Sigma is a good word, too. Each of the letters is an initial letter of the words: shielded, inert, gas, metal, and arc.

This easy-to-say word, sigma, is now used to describe the process. It is not a trade-marked word, and is used in the same sense as oxy-acetylene welding, gas cutting, or brown dog — just like any other descriptive adjective.

Metals Being Joined by Sigma Welding

Sigma welding can be used on practically all commercial metals. Railroad tank cars, chemical and food processing tanks, pressure vessels, and brewery equipment are only a few applications where the process is being used economically. Here's a quick look at some of the metals being joined by this process:

Aluminum . . . All weldable grades including 3-S, 50-S (150-S), 52-S, 61-S, and the commercially pure 2-S alloy are being welded with excellent results . . . These alloys are being machine welded in thicknesses ranging from 0.50 in. to 1.50 inch . . . Hand welds are made in material ⅛ in. and thicker . . . Maximum thickness that can be welded is unlimited with multi-pass technique . . .

Stainless Steel . . . Sound X-ray quality butt welds have been obtained in thicknesses ranging from ⅛ to ⅜ inch . . . Quite evident that heavier thicknesses can be welded . . . Results of tests show that welds possess good tensile strength, elongation, and impact resistance . . .

Copper . . . Sound butt, fillet, and corner welds have been made in ⅜ in. and ¼ in. deoxidized copper.

Everdur . . . Butt welds made in ⅛, ¼, and ⅜ in. thick materials are sound, smooth, and without cracks or undercutting. Tests showed that bend and tensile specimens have excellent properties.

Carbon Steel . . . Sound machine butt welds have been made in ⅛ in., ¼ in., and ⅜ in. thick killed and semi-killed carbon steels . . .

Aluminum Bronze rod has been deposited on mild steel with excellent results . . . Wear resistance greatly improved . . . Other surfacing and buildup operations very successful . . .

LINDE'S Apparatus for Sigma Welding

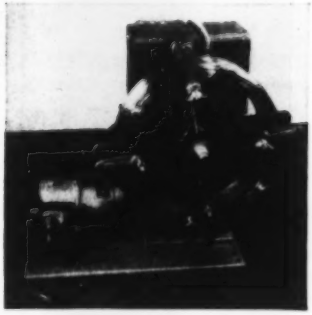
Here is LINDE's sigma apparatus for either machine or hand-welding. It provides automatic operation, accurate and uniform control of rate of rod feed, easy handling, and simplicity of operation . . . Everything to help you make X ray quality welds at high speeds.

Hand Torch Designed for Easy Handling

The LINDE HW-11 Torch is designed for sigma hand-welding. It is lightweight, and pistol-shaped to provide a convenient grip and easy handling. The gas cup and torch power cable are water-cooled for protection from overheating. All hoses to the torch are bound together in a synthetic rubber sheath which is highly flexible.

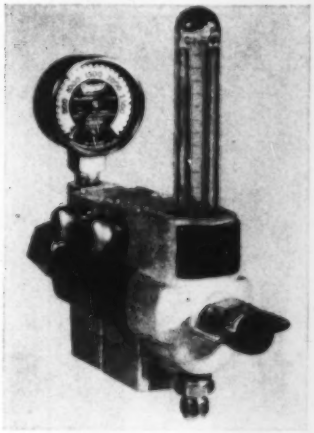
The rated capacity of the torch is 400 amp. when cooling water flow is 1 qt. per min. at inlet temp. of 60 deg. Fahrenheit.

Simple Assembly Controls Rod Feed



LINDE's Rod Feed and Control Assembly for hand-welding, automatically controls rod feed at all times. Rod is fed at a constant predetermined speed which is regulated by an electronic governor. Rate of rod feed depends on the current and material being welded, and can be easily adjusted by a potentiometer. A rough initial setting for the potentiometer is determined from welding data tables. After the arc is struck, the operator can adjust the potentiometer, if necessary, to get a steady, smooth arc. Welding is then done without any further adjustments.

Argon Regulator Assures Uniform Gas Flow

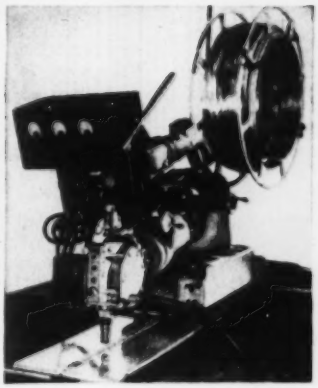


The OXWELD R-502 Regulator, designed specifically for inert gas welding, reduces the pressure of the argon stored in the cylinder to the working pressure needed. One simple setting adjusts it to supply the torch with the correct rate of argon flow required for the work at hand. A built-in flowmeter and throttle valve always show the flow of argon used. The indication is always true, and is not affected by the pressure drop between the valve and the working end of the torch.

Machine Welds Made at High-Speed with the FSM-1

LINDE's FSM-1 machine makes clean, smooth welds. Welding is fast and weld quality high. Almost any metal thickness can be welded by a suitable number of passes.

The FSM-1 is recommended for welding long seams, or for work that is fairly repetitive. The welding head can be positioned for practically any work requirement. It has provisions for vertical and lateral adjustments in two planes for the angle at which the welding rod is fed into the weld zone. Retract starting provides for starting the arc quickly and conveniently.



LINDE Argon (99.92% pure), and Sigma Grade

For welding stainless and carbon steels, LINDE argon — sigma grade, a mixture of oxygen in argon, speeds metal deposition. It permits welding at high speeds without undercutting, improves coalescence of the weld metal, and makes overhead welding of stainless steel practicable.

For those metals requiring a pure argon gas, LINDE offers standard welding argon that is 99.92 per cent pure. This high purity makes it the best all-around shielding gas.

For further information about LINDE's equipment for sigma welding, please contact any LINDE office.

The terms "Linde" and "Oxweld" are registered trade-marks of Union Carbide and Carbon Corporation.

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A DIVISION OF UNION CARBIDE AND CARBON CORPORATION
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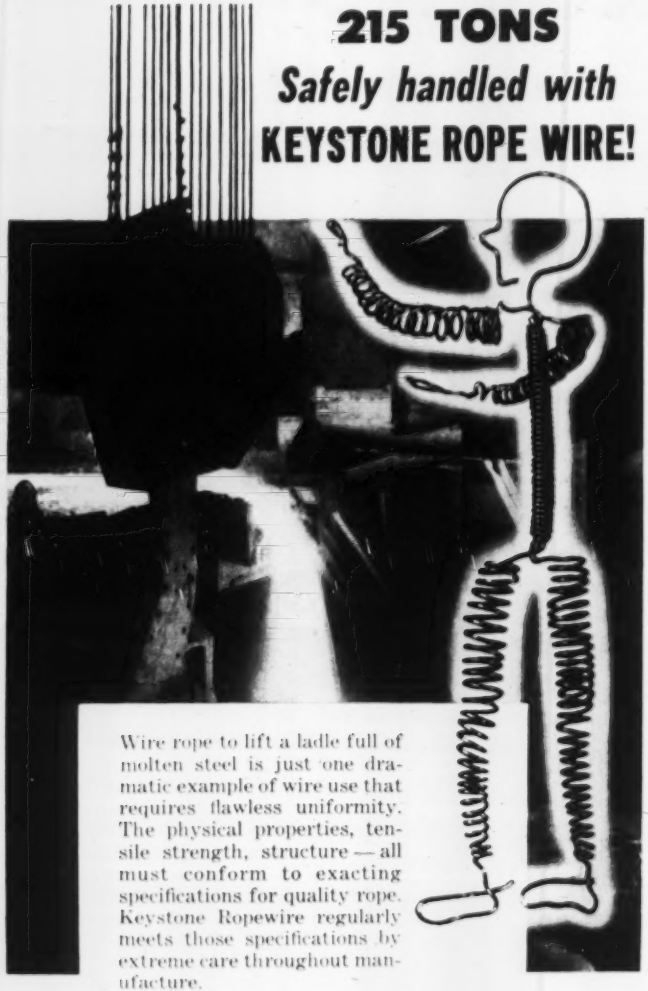

Wire rope to lift a ladle full of molten steel is just one dramatic example of wire use that requires flawless uniformity. The physical properties, tensile strength, structure — all must conform to exacting specifications for quality rope. Keystone Ropewire regularly meets those specifications by extreme care throughout manufacture.

INDUSTRIAL WIRE SPECIALISTS

The regular uniformity of all Keystone industrial wire is attained by careful selection of specially prepared steel, slow and meticulous processing and rigid inspections.

The same care and attention will be given to the wire you require for your product regardless of type and quality.

For your industrial wire problems consult with Keystone's Industrial Wire Specialist.

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PEORIA, ILLINOIS

STEEL

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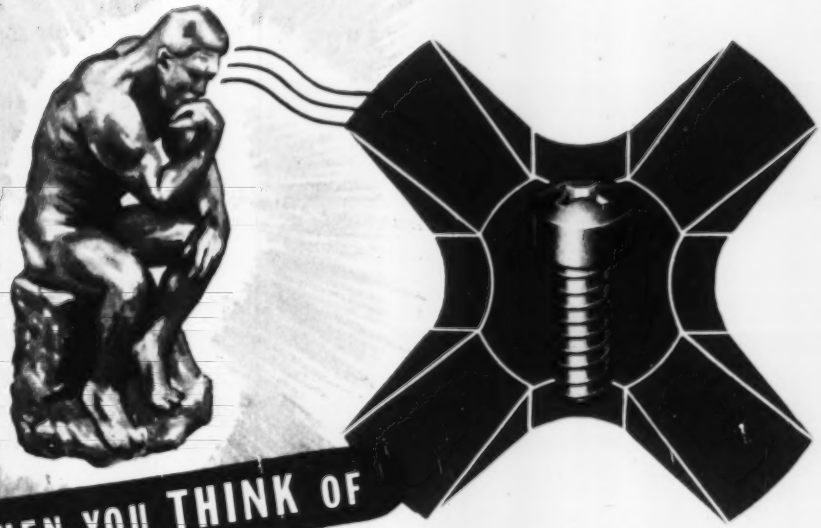

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PHILLIPS

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RESEARCH—Central's "perfect impression" of the famous Phillips recess is the result of many years of independent research in recessed head design and testing.

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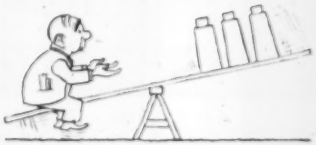
Makes the Felt for the Parts it Cuts

LETTERS
TO THE EDITORS

Balance in Steel Still Ahead



Your article "Steel Squeeze Eases" (Jan. 28, p. 35) was undoubtedly based upon factual information. Our company needs 500 tons of 11 gauge hot-rolled, pickled and oiled steel, 300 tons of deep drawing quality and 200 tons of standard hot-rolled steel. We haven't any large organization of our own to put in the field to get steel. Can you tell us who might book this order?

R. W. Phelps
Otaco Ltd
Orillia, Ont

We, as a relatively new and small steel customer, have contacted several steel sources throughout the country. They all seem to indicate that they have a tremendous shortage of steel and a huge backlog of orders.

We are very much interested in locating some of these sources that may have reported this easing of the steel shortage (Market News Section, Jan. 21 and 28).

Seymour Kessler
purchasing agent
Kessler Steel Products
Chicago

● *STEEL reported an easing of the steel shortage, noticeably easier in some items, no easing at all in others; not an overall balance of supply and demand. Since mid-January when the easing was first noted, certain items have continued to come into better supply: Cold-rolled sheets, secondary tin mill products, merchant tubing in the small diameters, and wire and wire rods.*

The Yearbook Near and Far

Your 1952 STEEL Yearbook was read with extreme interest. The arrangement of the publication was ideal . . . the summary of comments from the various executives in the metal-working industry most interesting and informative . . . statistical data will provide a handy source of reference for the year to come.

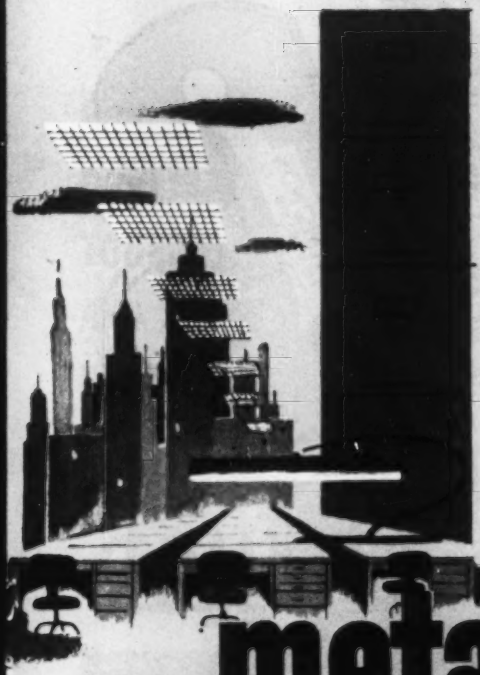
Might I add that I derive great satisfaction from reading your weekly magazine which keeps me abreast of industrial developments while being physically detached from industry. It is without doubt the best investment I have ever made.

Lane Jonap, Lt. (jg), USNR
Staff Material
COMFAIRHAWAII
F.P.O. San Francisco

We will appreciate receiving the 1952 Metalworking Yearbook. Thanks.

H. C. Bower
Trundle Engineering Co.
Cleveland

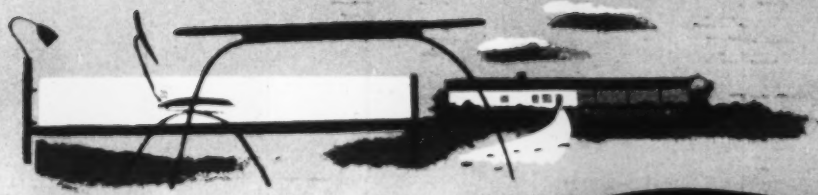
● *We're sorry but our supply of the Metalworking Yearbook issue of STEEL is exhausted. We still have limited supplies of some of the features contained in that issue, though.*



Functional beauty . . . lighter weight . . . greater strength . . . are only a few of the reasons why Van Huffel metal tubing and shapes make the "sky the limit" for designers of metal furniture. From office desks to day beds . . . from high chairs to hall trees . . . the list keeps on growing. As one manufacturer aptly put it, "You make in metal what we put on paper." Van Huffel is versatile.

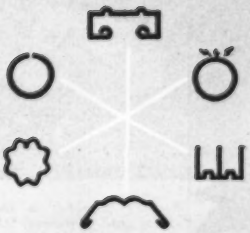
Van Huffel
cold-formed metal tubing and shapes
simplify the production
of

metal furniture



VAN HUFFEL

TUBE CORPORATION • WARREN, OHIO



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For 100% Performance get "RED END" Power Hack-Saw Blades

. . . they're 100%
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Cut-ability . . . that's the word for "Red End" Power Blades! *Cut-ability* that starts with special Simonds hack-saw steel, double checked for toughness and grain structure. *Cut-ability* that proves out *and pays off* on the job with straight fast cuts and *more cuts* per blade. Supplied in all standard sizes with a choice of these two types of steel:

High Speed Molybdenum for cutting mild alloys and general work where breakage-resistance and long life are musts.

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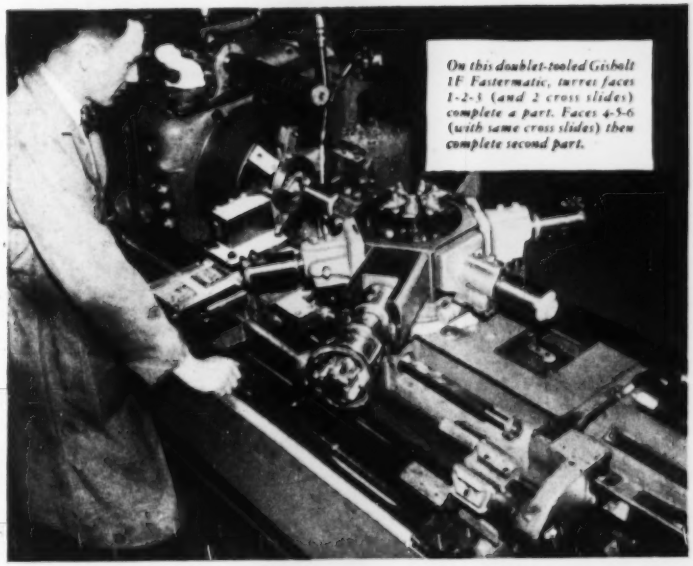
HOW DUPLICATE TOOLING... AND A FASTERMATIC...



On this doublet-tooled Gisholt 1F Fastermatic, turret faces 1-2-3 (and 2 cross slides) complete a part. Faces 4-5-6 (with same cross slides) then complete second part.

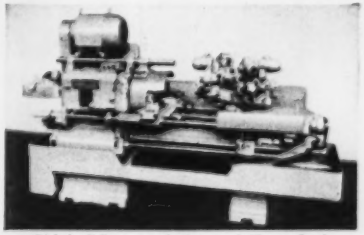
doubled production!

The time *and unit cost* for machining these cast iron pulley flanges were cut in half when the Fastermatic with double tooling took over the job.

Just three turret faces were needed to complete the machining and threading on each part. Therefore, tooling is repeated on the other three turret faces so that *two* parts are finished with each revolution of the turret. Production is doubled over the old method . . . time lag is cut to a minimum . . . there's twice the time between tool changes.

This smart setup illustrates one of the many ways Fastermatic Automatic Turret Lathes give you greater efficiency and lower costs on a broad range of jobs. And one operator can usually handle two or more machines. Ask for the facts.

Floor-to-floor time for these pulley flanges is down to 1.75 minutes. Duplicate tools and collapsing taps on the turret rough and finish the bore, chamfer and cut threads. Front and rear slides shave the angle and form the radius on the O.D.



Gisholt 1F Fastermatic Automatic Turret Lathe

GISHOLT MACHINE COMPANY
Madison 10, Wisconsin

THE GISHOLT ROUND TABLE *represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.*

TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

Oil-display service cabinets get lasting paint adherence

Industry surveys indicate that between 70% and 90% of all automotive lubricating oils are sold in cans . . . much of it from oil display service stands fabricated of Republic Electro Paintlok by Modern Metal Products Co., Greensboro, N. C.

● To keep oil-display service cabinets looking trim, bright and attractive on service station islands, this manufacturer has adopted Republic Electro Paintlok for all enameled cabinet surfaces.

Electro Paintlok is the zinc-coated sheet steel that's chemically-treated to *take* paints, lacquers and synthetic enamels *smoothly* . . . and *hold* them all equally well.

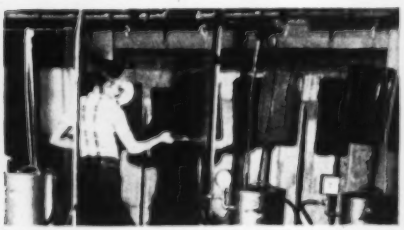
Even if the painted surface should be scratched or broken in service, the tight zinc coating prevents the spread of unsightly underfilm corrosion. Result: users of steel products enjoy a painted finish that *lasts*.

Electro Paintlok offers manufacturing economies, too. It comes to you in prime condition for painting, and usually requires only one simple cleaning to remove dirt acquired during storage and fabrication. Degreasing is necessary, however, when drawing compound is used, or when grease is present from other sources.

For all its full product-improving story, write for colorful free booklet 525. Address:

REPUBLIC STEEL CORPORATION
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N.Y.

Republic Electro Paintlok offers a tight zinc coating that will not crack, peel or flake during normal fabrication.



Oil-display service cabinet parts are sprayed with alkyd-resin enamel primer heated to 150°F.

Republic
ELECTRO ZINC PLATED SHEETS
Electro Paintlok · Electro Zincbond

REPUBLIC STEEL

Other Republic Products include Carbon, Alloy and Stainless Steels — Sheets, Strip, Plates, Bars, Pipe, Tubing, Bolts and Nuts, Wire

What's in Vermont this month?

NEW SLIDES ELIMINATE OIL FILM BEARING. Bryant has developed a preloaded ball bearing slide for their internal grinders that is unique in both construction and performance. It comprises sleeves with rows of ball bearings that provide rolling metal-to-metal contact. It forms an extremely sensitive, yet rigid, mounting.

Two of these bearings on one bar maintain axial alignment; a third bearing on another bar gives the slide a widely spaced, three-point support. The Bryant slide resists all lateral thrust since preload is radial. This design avoids the objectionable feature of conventional slides in which the oil film causes a slight flotation resulting in slight misalignment of the members.

One slide under the workhead and one under the wheelhead eliminate a compound slide and keep the workhead and wheel near the bed of the machine for maximum rigidity.

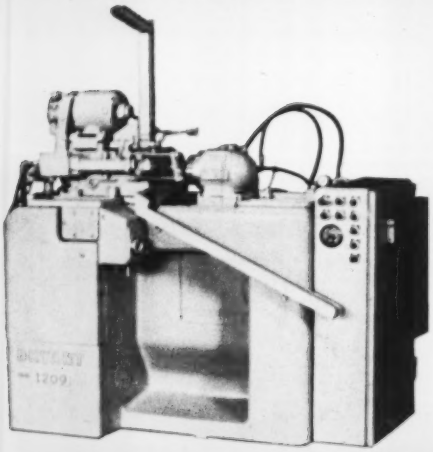
This design was planned for exclusive use on machines of the "high precision" class where a shift of 20 millionths of an inch due to oil film would result in work spoilage.

The design has proved so successful, where fast stock removal and extremely close tolerances are required, that this slide is now standard on the Bryant No. 1209 Automatic.

This is an example of how new basic design in modern machine tools can increase your precision production.

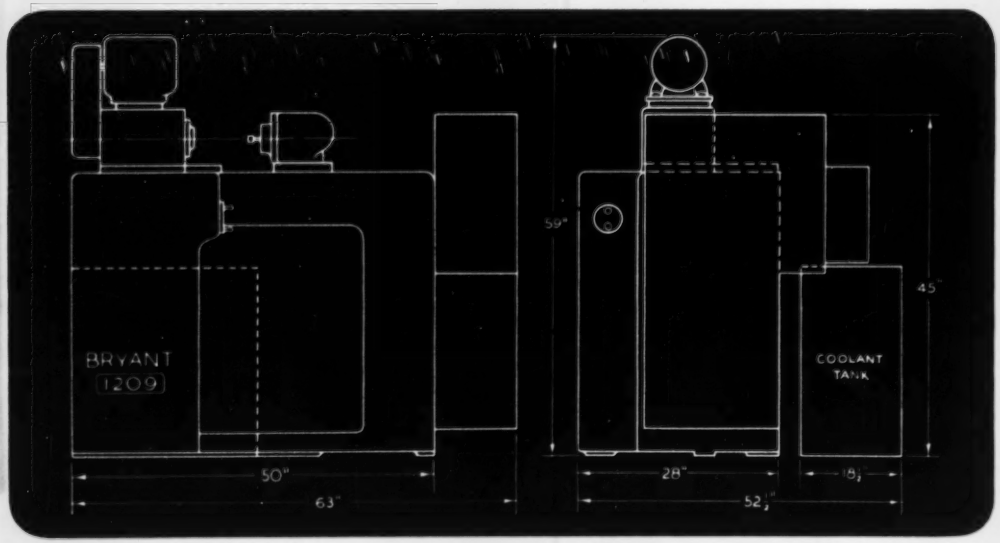
Bryant Chucking Grinder Company in Springfield, Vermont, U.S.A.

FOR HOLE GRINDING

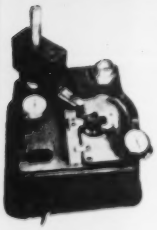


The Bryant 1209 Automatic Hole Grinder

This machine is designed particularly for high production, precision grinding of bores from $\frac{1}{4}$" to 3" in ball bearing races, gears, rolls, bushings, etc. Operator merely loads work, trips a valve to start cycle, and unloads the finished piece. The machine automatically *rough grinds, finish grinds and returns to chucking position when finish size is reached.* Hydraulic control, with individual throttles, gives infinitely variable control for each phase of the grinding cycle. The work spindle and cross feeds are driven by independent D. C. motors, giving infinite speeds and feeds with dial control. Wheel speeds up to 100,000 R.P.M. are obtained with the Bryant Hi-Frequency Wheelhead. Write for folder.



FOR CHECKING SQUARENESS OF UNDER-FACE

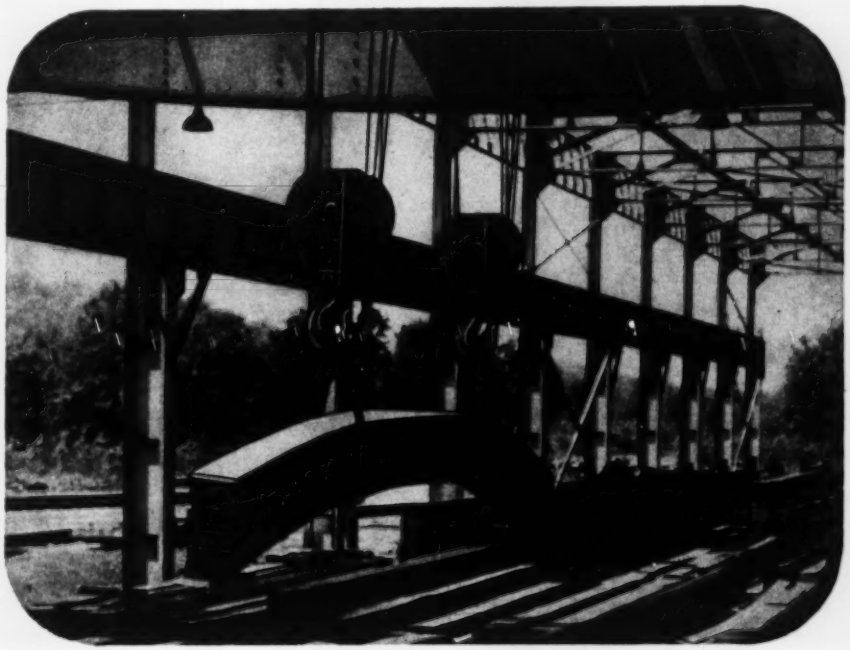


Bryant Thread Gage with Squareness-of-under-face Attachment

When an under face must be checked square with an external thread, the part should be held on the thread flank and rotated in this position. The Bryant Gage does this, regardless of variation in roundness, P.D., lead or thread form. The attachment can be adjusted to check the under face of any part which can be held in the gage. Illustrated is the No. 2 gage with a range from 1" P.D. to 2½" P.D. Simultaneous readings can be made — the attachment shows face run-out — the Bryant Thread Gage checks thread size — *giving accumulated reading of P.D., form and lead on dial indicator 4 to 5 times faster than plug gaging.* Send for folder.

Bryant Chucking Grinder Company in Springfield, Vermont, U.S.A.

WIRE ROPE



This is the longest-lasting rope we've ever made for industrial use

ROEBLING HAS been making wire rope for more than a hundred years. And during all that time we've been developing new kinds of rope, and making them better.

Today, about the first thing you ask about a wire rope is, "Has it got what it takes? Will it stand up and cut replacements?"

Our answer is an emphatic *yes*, because Roebling Preformed Blue Center Steel Wire Rope meets the severest tests of tensile strength, abrasion resistance and general toughness.

There's a Roebling rope that will prove the longest-lasting and most economical in your operations. Call on your Roebling Field Man for his recommendations. John A. Roebling's Sons Company, Trenton 2, New Jersey.

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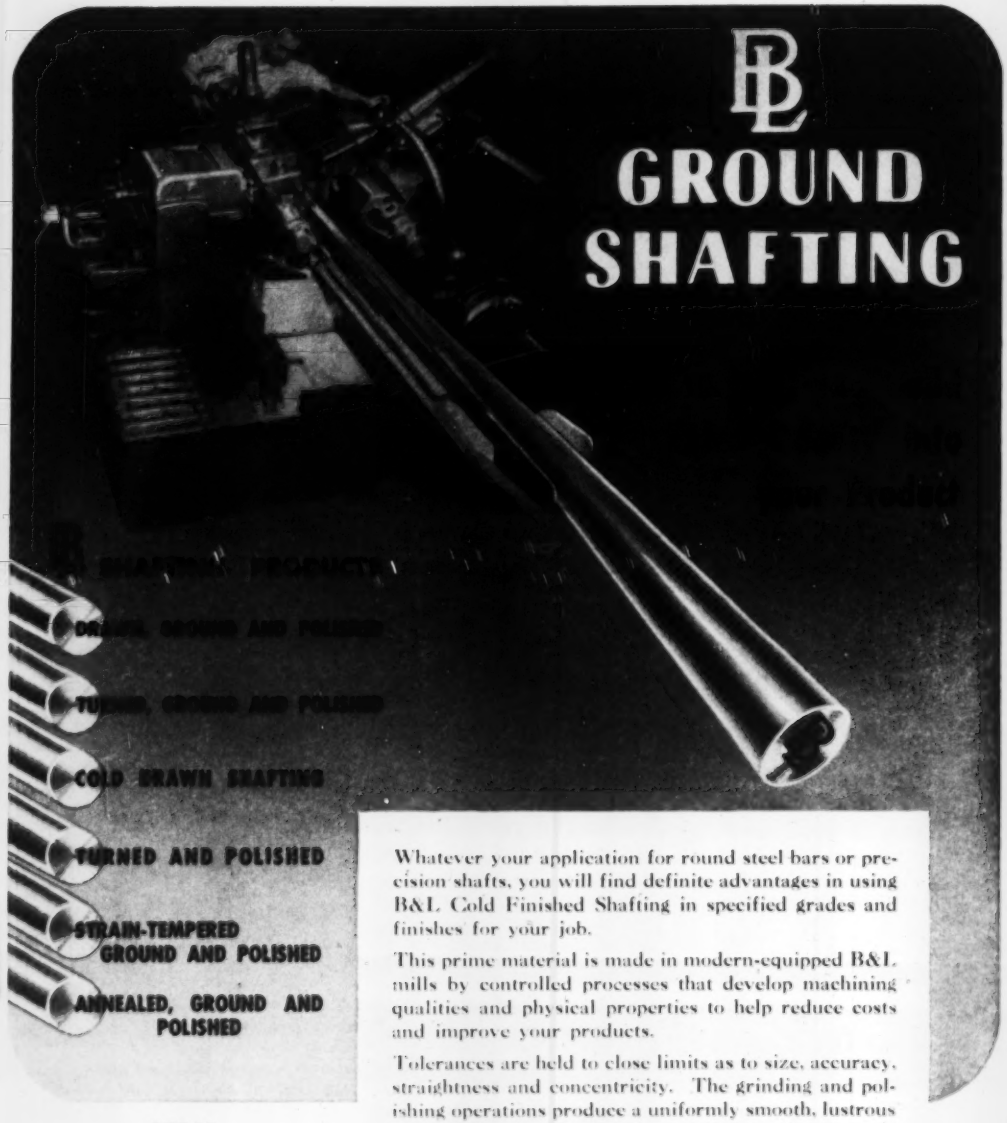

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is vitally needed for Defense Steel . . . be sure your SCRAP goes back to the mills

Whatever your application for round steel bars or precision shafts, you will find definite advantages in using B&L Cold Finished Shafting in specified grades and finishes for your job.

This prime material is made in modern-equipped B&L mills by controlled processes that develop machining qualities and physical properties to help reduce costs and improve your products.

Tolerances are held to close limits as to size, accuracy, straightness and concentricity. The grinding and polishing operations produce a uniformly smooth, lustrous surface, free from defects . . . minimizing friction and providing a bright finish.

Refer your problem to B&L Shafting specialists . . . to select the right grade for your needs.

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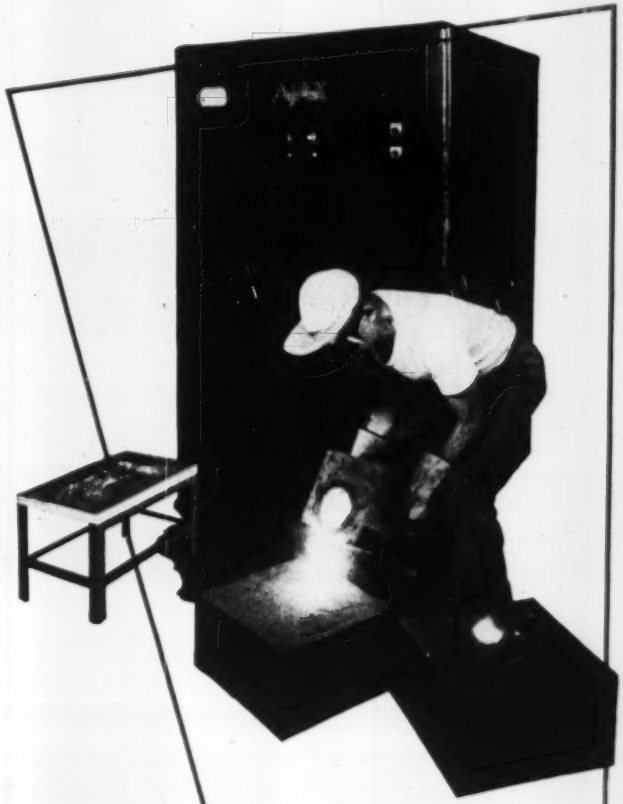
. . . FOR MELTS FROM 3 TO 60 POUNDS
. . . FOR MELTS OF ANY METAL



AJAX-NORTHRUP
20K.W. FURNACE

All the speed and accuracy of induction melting in one compact, efficient 20-kw furnace unit. Easy to operate. Automatic stirring. Self-tuning. No moving parts to wear out, maintenance limited to annual inspection of two electrodes. Also available in 3, 6 and 40-kw sizes. Here are a few typical applications:

LABORATORY MELTING:
Complete freedom from contamination. Accurate analysis control. Produces melts in minutes instead of hours. Results can be reproduced exactly in large induction furnaces.

PRECISION CASTINGS:
Speed of melting and accurate control of analysis and temperature make this equipment ideal for small-quantity precision casting. Requires little floor space, fits right into production line.

MELTING GOLD, SILVER, PLATINUM, OTHER PRECIOUS METALS:
Because of low losses, freedom from contamination, and high speed of melting, induction furnaces are used in nearly all mints, assay offices and most refineries.

MELTING NON-FERROUS ALLOYS UP TO 60 POUNDS:
Melts 30 pounds of red brass in 22 minutes from cold start. No contamination. Close control. Switch from one alloy to another by simply changing crucibles.

MELTING FERROUS ALLOYS UP TO 30 POUNDS:
No carbon contamination. Melts 17 pounds of steel in 40 minutes from cold start, 30 pounds in an hour and a half.

Send for free technical bulletin 14-A.

138

FOR HEATING AND MELTING

AJAX NORTHRUP

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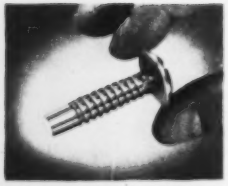
DELIVERED:

750 lbs. of imagination

to help you outdistance competition!



News about nuts and bolts

Not too long ago many types of stainless fasteners couldn't be made commercially because no chrome-nickel stainless steel had a slow enough rate of work-hardening. Then A•E•Service was called in. Result: Carpenter Stainless No. 10, the first of its kind, made possible a new, important product.

More "muscle" for tough jobs

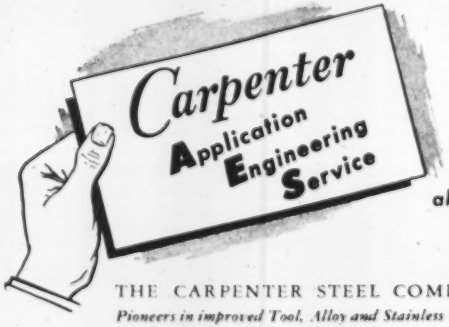
"We need an air-hardening die steel that is tough, hardens through in large sections, and can be heat treated with less fuss at a *lower* temperature!" A•E•Service accepted the challenge and went to work. Result: Carpenter Vega, the *only* air-hardening die steel that offers all these advantages.

From the minute those specialty steel bars from Carpenter hit your receiving dock, you have a headstart in improving your competitive position.

That's because Carpenter's **A**pplication **E**ngineering **S**ervice rides along with every bar delivered. **A•E•Service** is Carpenter's way of working with customers . . . helping them get more than "expected performance" from specialty steels. This is why the Carpenter man seldom takes your application for granted. He wants to *know* about the job. Often, former production or performance records just aren't good enough. Mill specialists may even tear the job down, then build it up again with steels virtually "tailored" to your needs.

If trends in industry indicate the need for a new steel, that's a job for **A•E•Service**, too. The fact is, Carpenter customers are often the first to profit from a pioneering program developing new and better steels to accomplish hitherto unheard-of results.

This is **A•E•Service** . . . a truly different concept of service on specialty steels. This is the thinking and imagination that accompany every bar of Carpenter Steel you apply.



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FOR SPEEDING PRODUCTION SCHEDULES

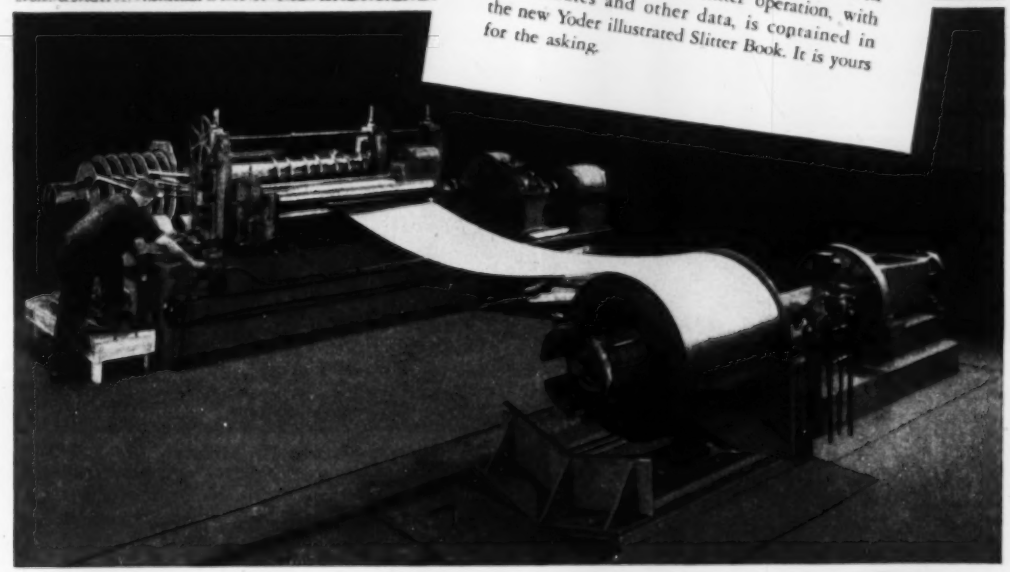
If you have a Yoder slitter you can buy mill-width coils instead of slit strands. Sources of supply of mill-width coils are more numerous, so you can buy wherever you like, at substantially lower prices, and obtain quicker deliveries.

Inventory requirements, too, are greatly reduced, because you can, in a few hours, meet expected and unexpected demands for slit strands with a relatively small stock of mill-width coils of the proper gauges.

This means better control not only of coiled strip supply, but of production planning; and production schedules are much easier to meet.

For requirements as low as 100 tons per month, direct savings alone may be sufficient to repay your investment in a Yoder slitter in the short time of a year.

Information on the respective merits of different types and sizes of slitters and accessories, as well as on the economics of slitter operation, with time studies and other data, is contained in the new Yoder illustrated Slitter Book. It is yours for the asking.



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Complete Production Lines

- ★ **COLD-ROLL-FORMING and auxiliary machinery**
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- ★ **PIPE and TUBE MILLS**—cold forming and welding

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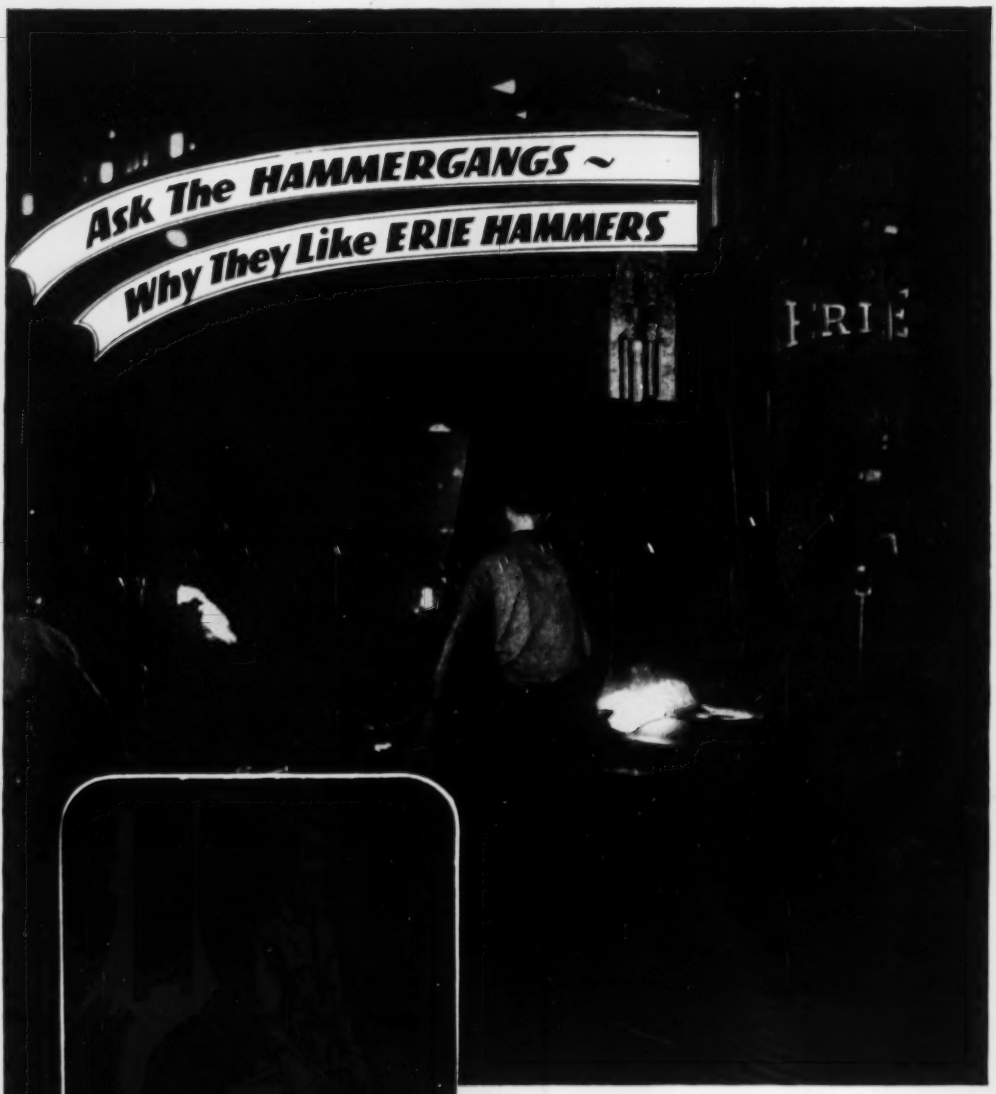

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NOTES:-
1. MATERIAL- A.I.S.I. C1141 OR C1144 STEEL.
2. INDUCTION HARDEN TEETH ONLY .015 TO .030 DEEP, ROCK. 'A' 80-84.
3. REMOVE BURRS
4. CONCENTRICITY OF P.D. AND CENTER BORE TO BE WITHIN .002 TOTAL INDICATOR READING.
6.4 M/M (.252) +.004 -.000 DIA. HOLE
REMOVE BURRS.
HOLE MUST NOT BE OFF CENTER
INDUCTION HARDENED TOOTH AREA
SECTION AA
SCALE 10:1
.015 TO .030 CASE AT THIS POINT.
DETAIL OF TOOTH HARDENING
16 TEETH
.4333 P.D.
.4300 OUTSIDE DIA.
SECTION SHOWING
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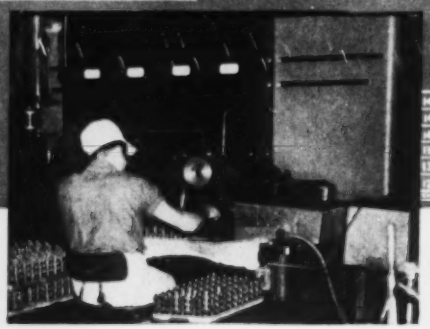
Why MAYTAG uses RF HEATING for BETTER, FASTER, CHEAPER PRODUCTION



● The Maytag Company has found, for fast production at low cost and high quality, Westinghouse RF Heating installations are the answer.

The installation of a process using two 20 KW-450 generators—for both spline and straight shaft hardening—has paid for itself in *less than 3 months!* This was shortly after World War II, and since then continued use has piled up real profit in savings.

In building a new plant for production of a completely new line of automatic washing machines, Maytag turned to induction heating for brazing and hardening . . . and they specified Westinghouse. A 50 KW and 10 KW RF generator, with associated work handling equipment, are now accounting for still further savings and continued high quality. That's why Maytag says that not only is the Westinghouse RF process the best method for heat treating production parts, but, also, "it produces precision work at the price of rough and ready work."

As we helped Maytag, let us help you solve your problems of increased production at low cost and with high quality. By all means, investigate the possibilities of installing Westinghouse RF Heating.

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PULLING
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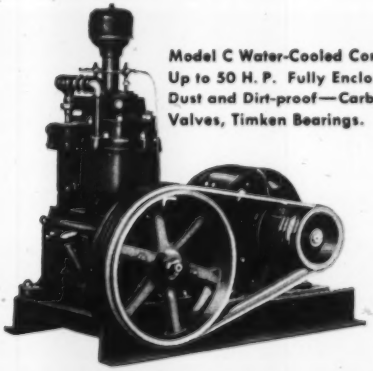
PROBLEM?

—For low-cost handling of materials, machines or component parts

Choose a **CURTIS AIR COMPRESSOR**
FOR INDUSTRIAL APPLICATION



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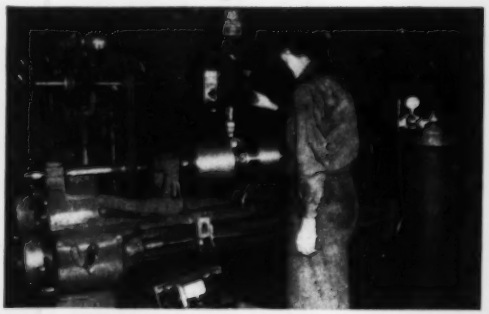
Low pressure breathing oxygen cylinders must be perfect . . . there are no re-fills at 40,000 feet.

Many things can happen at 40,000-plus. But today's precision-trained sound-busters can usually handle them all. But let their vital oxygen supply go wrong and in a matter of seconds there is nothing that can be done.

To meet rigid service specifications, D. K. Manufacturing used Thor-Tung electrodes and Heliwelding. Using both the manual, water-cooled Heliweld holder for welding spuds into position, and the Heliweld Automatic Head for production line runs while welding cylinder halves, D. K. turns out breathing oxygen cylinders which test a leak-free 700 psi – hundreds of pounds above working pressure requirements.

Inert gas-shielded Heliwelding eliminates the need for flux . . . prevents slag formation—permitting 'clear view' operation. Its gas-shielded electrode provides a highly concentrated arc . . . permitting exceptional welding speeds with a minimum of distortion.

Production-running these oxygen lifesavers is just one of the countless jobs Heliwelding can do in your plant or shop. Find out how it can be used for you. Write . . . or phone your nearest Airco Office. Ask for your copy of ADC-709: "Heliwelding—Catalog 9".



Manufactured by the D. K. Manufacturing Company, Chicago, Illinois, breathing oxygen cylinders like those above must be the products of perfect welding. To insure perfection on a production-run basis D. K. uses Heliwelding for their construction.

AT THE FRONTIERS OF PROGRESS YOU'LL FIND AN AIR REDUCTION PRODUCT

Completed Breathing oxygen cylinders

Companion piece of the Heliweld Automatic Head, this jig-mounted manual, water-cooled Heliweld Holder fastens outlet spuds at the rate of nearly two hundred a day to begin the production run of oxygen breathing cylinders for D. K. Manufacturing Co.

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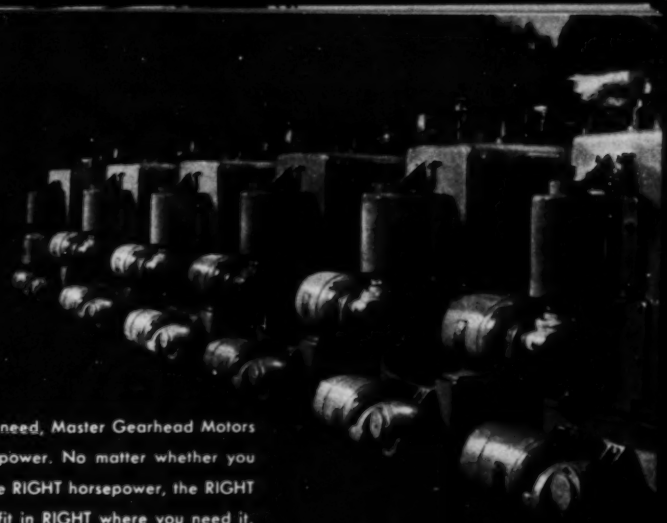

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And nowhere, except in the Master line of Gearmotors, will you find power units that are so flexible, so easily adaptable, and in such a wide range of sizes and types. They are available in any size, 100 HP and smaller . . . and for all cycles, phases and voltages . . . in open, splash proof, totally enclosed, fan cooled and explosion proof types . . . with Speedrangers (mechanical variable speed) and Unibrakes . . . for every type mounting . . . and over a gear reduction range up to 432 to 1.

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It also Flatters the Features while

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You expect protection in a safety goggle and you certainly get it in the new, strongly constructed AO F-1100 Safety Goggle with its 6 curve super armorplate lenses, new eyewire, rugged endpieces, double braced bridge and other quality features. But what's more, it's protection that workers are glad to wear because this goggle is good looking as well as functional. Your nearest AO Safety Products Representative can supply it — with or without side shields.

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(5 NEW CONSTRUCTION FEATURES)

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The few pennies you may save on initial cost for a lubricant are really *small game*. The *big savings*—such as reduced maintenance costs—come when you use Correct Lubrication!

For example—one plant, in the year following installation of a program of Socony Vacuum Correct Lubrication, saved $60,000 on machine maintenance alone! In this same period, total cost of lubricants—including cutting oils—was only $50,000!

In addition to *maintenance* savings, Correct Lubrication also helps you achieve more continuous production, less power loss and lower over all lubrication costs.

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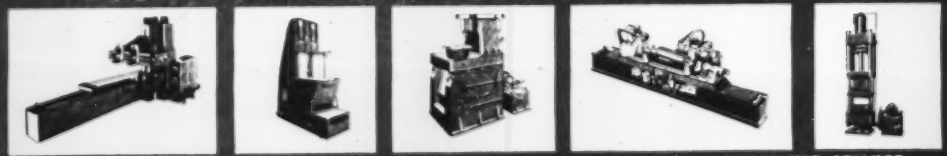
The Right Oils for Machine Tools, Presses... Every Machine in Your Shop



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a "mechanic's eye view" shows why TOWMOTOR *costs less to maintain*

You don't have to work on lift trucks long before you learn the things that are important for low-cost maintenance: Things like easy accessibility . . . a dependable, *industrial* type motor . . . double universal joints that soak up shocks instead of passing them along to transmission and crankshaft bearings. You learn to appreciate a highly accessible clutch and transmission . . . and a degasser that *really* means business.

You'll find all those "mechanic's" features in Towmotor. And wherever you put your Towmotor to work, you can be sure of obtaining genuine, *packaged* Towmotor replacement parts, to keep your Towmotor on the job year in and year out. Towmotor Corporation, Div. 16, 1226 E. 152nd Street, Cleveland 10, Ohio.

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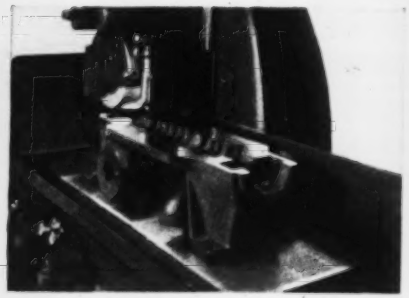
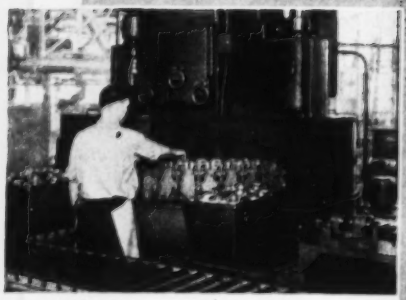
HOW MANY PEOPLE HAVE YOU TALKED TO ABOUT **AMERICANISM** TODAY?

WHERE THERE IS A FLAT SURFACE TO GRIND THERE'S A MATTISON TO GRIND IT.



40 hours before — now 4 hours. Pump case ground on Mattison Horizontal Spindle Precision Surface Grinder.



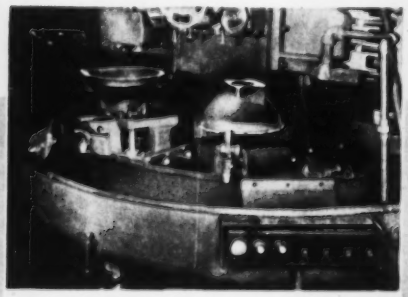
700 connecting rods per hour, using 40 station fixture to finish grind crank and wrist pin end of assembled rod with Mattison No. 72 Grinder.

With the addition of the production grinding machinery formerly made by the Hanchett Manufacturing Company, Mattison is now in a position to work with you on all your surface, face and disc grinding problems. These machines are made in various types to handle a wide range of work. Experienced engineers are available to give you best production efficiency, finish and tolerances, with Mattison machines.

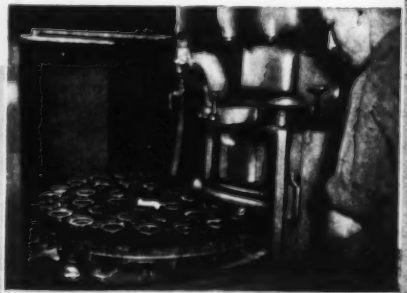
For any flat grinding ask for our recommendations on the proper method and machine for your job. No obligation, of course.

For catalogs on any of the types shown or if you would like a copy of the general bulletin, let us know and we'll gladly send them to you.

Grinding Cast-Iron Cams — 5" diameter, 1½" thick — stock removal, each side .030". Production 120 surfaces per hour on Mattison (Hanchett Type) Rotary Surface Grinder.



200 Transmission Case surfaces ground per hour on Mattison (Hanchett Type) Rotary Automatic Grinder. A special 8-station mechanical fixture permits one operator to grind each end of this large 35 lb. casting, flat and parallel. Stock removal .050".



320 surfaces of cast iron compression heads per hour, removing 1/32" stock with Mattison No. 24 Rotary Surface Grinder.

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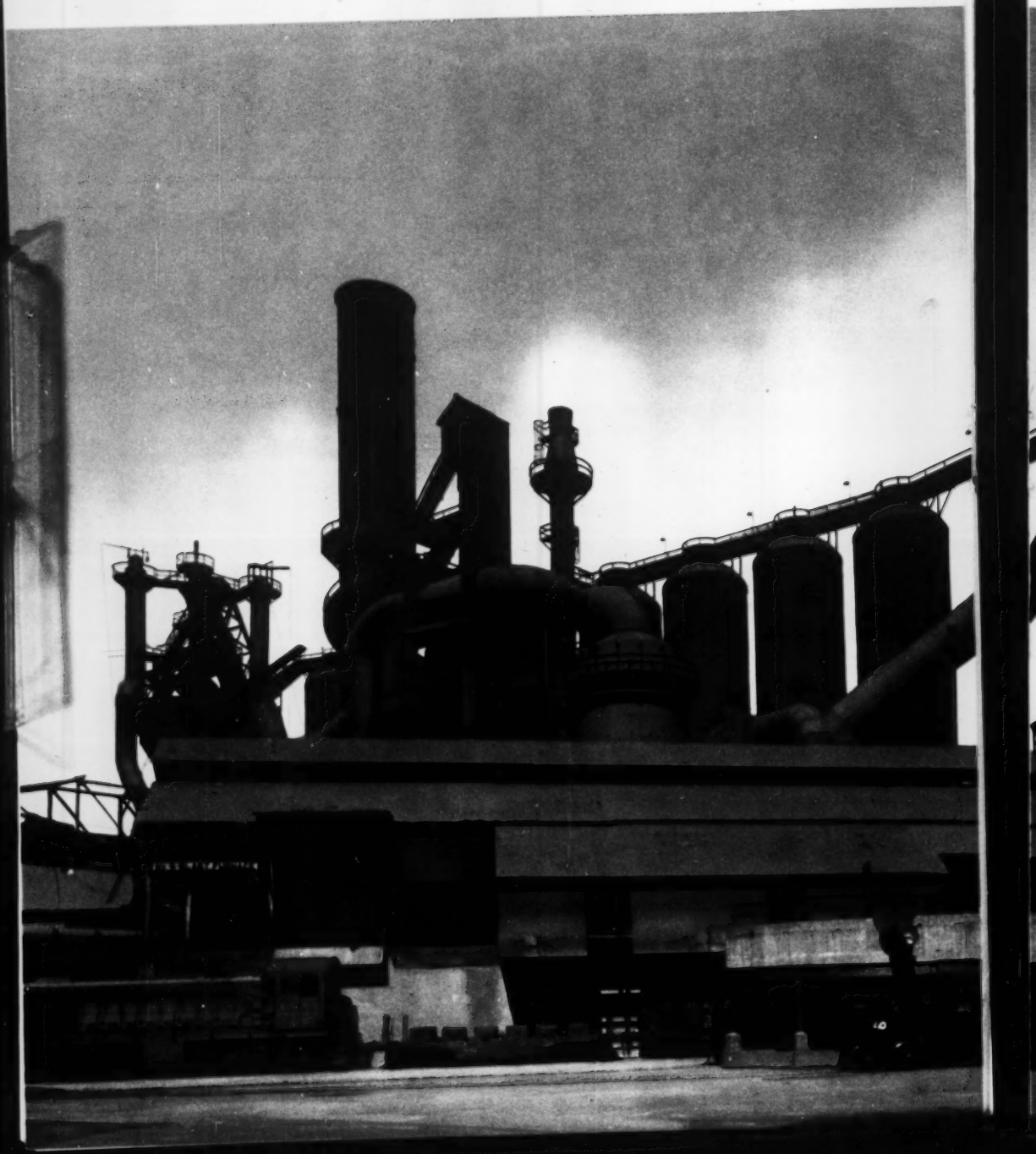
PHILLIPS *Cross-Recessed-Head* **SCREWS**

As Advertised in The Saturday Evening POST

THE FASTENERS OF TODAY . . . AND OF THE FUTURE

Koppers Rebuilds Blast Furnace...



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● This new blast furnace was recently constructed by our Freyn Engineering Department. It has a hearth diameter of 25 feet and a capacity of 1,100 net tons of iron per day. The old furnace, which it replaced, had a hearth diameter of 21 feet and a capacity of 776 net tons of iron per day.

Soaring 225 feet skyward, this new blast furnace will, of course, produce far more iron each year than the old one. In fact, it is estimated that the annual increase in production will amount to 112,000 tons.

Besides enlarging the hearth, Koppers engineers installed the most modern accessory equipment throughout the new furnace. All that remains of the old stoves, for example, are the shells and a portion of the original foundation.

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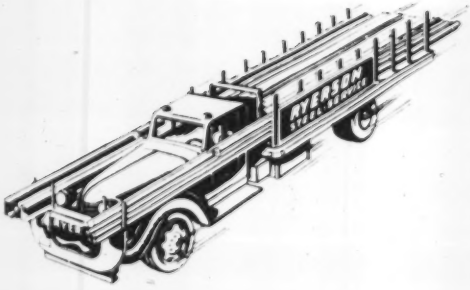

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The Metalworking Outlook

March 3, 1952

$1 Billion in Tool Orders

Some $1 billion worth of new machine tool orders for defense will be placed this year, most of it by July 1. An NPA official makes that prediction and says the new orders will come on top of the present machine tool order backlog that's between $1.3 billion and $1.4 billion. The cancellations of tool contracts that have occurred in past weeks came about largely because of obsolescence of some aircraft parts for which the equipment was intended. Significance: Tool builders are going to concentrate more on finding good subcontractors to help handle the backlog.

Rumblings in Steel Case

You'll hear more rumblings from Congressmen from now until the steel wage case is settled at a "deal" among WSB, the unions and the steel companies. Rep. Leo Allen (Rep., Ill.) hinted darkly at investigations of reports that the union will get 15 cents an hour and the steel companies $2.40 to $3 a ton price increases. If that comes about, the steel companies had no part in the arrangement because such a price hike won't begin to cover costs of the 15-cent wage rise.

Internal Divergence

Growing more apparent is a fundamental difference in thinking on labor contracts by two important CIO unions, United Steelworkers of America and United Auto Workers. USA in the bulk of its bargaining will dicker for short-term contracts with straight wage increases. A National Industrial Conference Board analysis of UAW contracts shows a definite swing to long-term agreements with escalators and annual wage increases. At the moment UAW is embarrassed by its escalator clauses because most of them are tied to the old consumers' price index, and the job of shifting to the new one just brought out by the Labor Department's Bureau of Labor Statistics will be tricky and highly technical.

Psychology and Shortages

The sudden improvement in supplies of steel, aluminum and even copper is partly psychological, claims Defense Production Administration. Scare buying and padded materials requirements are disappearing, it believes. DPA says many aluminum and steel products are still critical and no across-the-board decontrol of those metals will be possible in the third or fourth quarters, despite reports now circulating to that effect. Still possible is broad decontrol of those two metals by next Jan. 1 or shortly thereafter.

Turn-About

As an indication of the reversal in the availability of materials, NPA heard aluminum fabricators report that they have more than enough stocks in their plants now to meet all the top priority orders placed with them. They urge the government to channel additional supplies of the metal in the second quarter to "those civilian industries

Production-Engineering News—p. 75 The Market Outlook—p. 159

that have suffered" from aluminum cutbacks. Only a month ago more CMP tickets for aluminum were out than could be cashed.

Steel Expansion

Contributing to the psychology of plenty that DPA talks about may be the realization of the steel expansion's extent (p. 51). More and more steel executives are wondering—privately for the most part—if they have over-expanded and if they'll be able to sell everything they can make in 1953 when most of the program will be completed.

For Federal Spending

The changing economic conditions have started some of the President's economic aides to sharpening their pencils again. Presidential Adviser John Clark is now talking about "a drop in government expenditures precipitating a serious depression by 1955." By indirection he and others are building up arguments for continued high federal spending. One of the few Administration opponents to that course you can expect to be Commerce Secretary Charles Sawyer who is already trying to quell some of the alarmists about this year's outlook. He concedes some soft spots in 1952 but predicts no "large recession."

New Look at Unified Buying

One phase of the unified purchasing plan for the armed services will get new scrutiny. The University of Michigan's School of Business Administration will study the effectiveness of the system for motor vehicles. Under the present set-up Army Ordnance purchases all types of vehicles for all services. Requested by the Munitions Board, the study will delve into operation of the system at the Pentagon, the Air Materiel Command at Wright Field, the Ordnance Tank-Automotive Center at Detroit and several Ordnance districts.

Straws in the Wind

Swing toward emphasis on more coking facilities is seen in fast write-offs given to Bethlehem ($38 million), J & L ($23 million) and Sharon ($5.5 million) . . . WSB extended indefinitely its regulation allowing cost-of-living wage adjustments . . . NPA will give consumer durable goods manufacturers 10 per cent more cold-rolled sheet and strip, hot-rolled strip and tin mill black plate steel for this quarter . . . Vanadium Corp. of America's five-furnace ferroalloy plant at Graham Station, W. Va., should go into production in April . . . New president of Colorado Fuel & Iron Corp. is Alwin F. Franz; Carl W. Meyers is board vice chairman.

What Industry Is Doing

There's more business, but fewer companies doing it (p. 47) . . . An NPA survey shows metalworking employment on the upgrade (p. 48) . . . New technique cuts taconite processing costs (p. 48) . . . Sales, not production, will be the major problem in '52, says Westinghouse's Price (p. 49) . . . WSB formalizes policies on commission earnings and retirement, profit-sharing plans (p. 49) . . . Tennessee Steel Corp. breaks ground (p. 50) . . . Bad luck in materials slows the lucky token industry (p. 50) . . . Build-up in Steel: Special Report (p. 51) . . . Contractors, steel fabricators raise the cry for relaxation of building controls as availability of construction materials improves (p. 59).

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PUNCHED NUTS MILLED NUTS
HARDENED AND GROUND NUTS

Whatever your needs may be, whatever the size, United has the equipment to produce them in any quantity, standards or specials. Our hardened and ground nuts are masterpieces of perfection, made to the most exacting engineering specifications.

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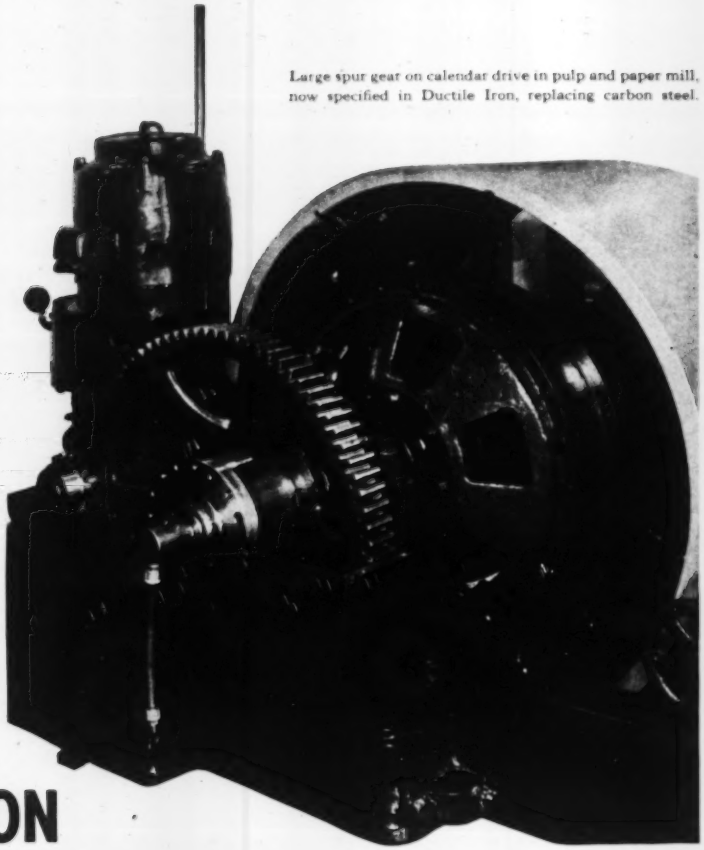
CLUTCH HEAD SCREWS
STAMPINGS

United Screw and Bolt Corporation

Chicago 8 Cleveland 2 New York 7

Large spur gear on calendar drive in pulp and paper mill, now specified in Ductile Iron, replacing carbon steel.



DUCTILE IRON

Proves Its Stamina in Machinery Gears

Black-Clawson Company of Hamilton, Ohio, reports several advantages obtained in their production of paper mill and allied equipment by replacing alloy gear castings and forgings with parts made from Ductile Iron.

The gear, illustrated, is typical of these Ductile Iron castings.

Not only has Black-Clawson saved critical materials by using Ductile Iron, but the ease of fabricating contributes to the maintenance of production schedules.

Black-Clawson foundries now produce Ductile Iron in five basic grades for castings that range from less than a pound to more than 7½ tons in weight. Tensile strengths up to 216,000 p.s.i., and hardness that exceeds 400 BHN, may be attained by heat treating Ductile Iron. This company also successfully welds Ductile Iron to steel, to stainless steel, and to itself.

Ductile Iron applications include as-cast and heat treated components for industrial, automotive and agricultural equipment. Also, for railway and other heavy industrial equipment, as well as that used in textile, electrical, marine and other fields too numerous to list.

Counsel and data on Ductile Iron are freely available to help promote intelligent utilization of critical materials. Send us details of your prospective uses, so that we may offer a list of sources from some 100 authorized foundries now producing Ductile Iron under patent licenses. A list of publications on Ductile Iron is available on request.

INCO

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK 5, N.Y.

Another Freedom Threatened

Unless thinking Americans awake immediately to a danger that threatens and take prompt action to repel it, another important individual freedom will be lost, probably beyond recall.

The nation faces the grave threat that a government agency will yield to the pressure of powerful union leaders by making it compulsory for a person to belong to a union to hold a job. In paving the way for this drastic step, union officials first forced the government administration to grant the Wage Stabilization Board authority to act in labor disputes. Then Congress was tricked into repealing a provision of the Taft-Hartley law which permitted employees to determine whether or not they desired to work under the compulsion of a union shop. Later union pressure forced Congress to amend the Railway Labor Act to permit union shop agreements.

Two weeks ago a Presidential Emergency Board "recommended" that over a million non-operating employees of railroads be subjected to compulsory union shop conditions. Right now, terrific union pressure is being exerted upon the Wage Stabilization Board to recommend that compulsory unionism be made a part of the settlement of the cases now before WSB involving 685,000 employees of the steel industry and of two aircraft manufacturing companies.

Favorite argument advanced by union leaders in favor of compulsory union membership is the "free rider" theory. It is that unions bargain for all employees, that all employees benefit and therefore all should contribute to the cost. This sounds reasonable until one remembers that no other organization, no matter how constructive its objectives, enjoys a monopoly such as compulsory unionism would provide. There is not as much excuse for forcing every worker to belong to a union as there is for suggesting that every citizen be compelled to contribute to the American Red Cross.

Such compulsion substitutes tyranny for the freedoms guaranteed by our constitution. Remind your representatives in Washington that Congress still can atone for its inexcusable amending of the Taft-Hartley and Railway Labor Acts by blocking any move by administration agencies to sell job holders into slavery.

E. L. Shaner

EDITOR-IN-CHIEF

RELUCTANT UNIONISTS: Postscript to the foregoing: If your congressman or senators happen to be disciples of the late Franklin D. Roosevelt, you could remind them that although F.D.R. gave union leaders considerable license, he did call an abrupt halt when they tried to "sell" him compulsory unionism. In 1941 when the union shop issue flared up in the

captive coal mine dispute, he pledged that the government would never invoke compulsory union membership.

The cold truth is that under Presidents Roosevelt and Truman union leaders have received so much government assistance that membership in their unions should be twice what it actually is. One reason why membership has not grown more than it has is that many unions are run by arrogant and sometimes tyrannical bosses. The percentage of reluctant union membership is high and would be still higher if compulsory unionism were to prevail.

* * *

REFRESHING PROPOSAL: Last week Sen. Tom Connally, chairman of the Senate Foreign Relations Committee, heard testimony on the proposed St. Lawrence seaway and power project. Most of the arguments—pro and con—that have been presented time and time again during the last 20 years were rehashed. However, two new factors were introduced.

One is that the development of new iron ore sources in Labrador and elsewhere, coupled with the more rapid depletion of high-grade Lake Superior ores, brought to the hearings many supporters of the project who previously had opposed it. Secondly, Senators Aiken, Douglas, Ferguson, Hickenlooper, Kefauver, Lehman, Moody, Taft, Thye and Wiley—a distinguished group of Democrats and Republicans—offered as an amendment to pending seaway legislation a proposal to set up a St. Lawrence Corp. which would sell bonds to private investors to pay the United States' share of the cost of the project.

This is an exciting and refreshing alternative to the orthodox method of tossing the cost of public works onto the shoulders of taxpayers. The idea should be studied carefully and not abandoned summarily because at first blush it may seem to be impracticable.

* * *

NEW BLS PRICE INDEX: During the last five years the Bureau of Labor Statistics has been working on a revision of its wholesale price index. Last Monday the bureau issued the last report in which the old index was used and on Friday its report for the week ended Feb. 26 was based on the new index.

Many companies in the metalworking industries should become familiar with the new index because it undoubtedly is a more useful aid to business than was the index it supersedes. It covers about 1800 commodities compared with 900 in the old index. Also it is based upon the average of prices for 1947, 1948 and 1949, whereas the old index was based on the average of a single year—1926. It is claimed that the "weighing" of individual commodities covered in the index has been improved.

These refinements should make the index reflect current conditions more accurately than heretofore was possible.

* * *

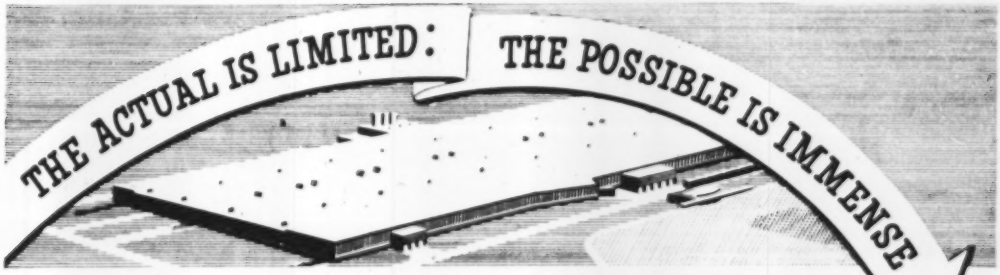
INVITATION TO LOAF: Interesting debate centers upon the question of whether or not compensation beyond that provided by state unemployment benefits should be paid employees who are idle because of conversion from peacetime to defense work. The Moody-Dingell bill, introduced in House and Senate, would provide federal funds to augment those received from state unemployment reserves. One analyst of the provisions of the bill says that if it is adopted a single man who earns $60 a week when working would be given $53 a week when idle.

Most state unemployment reserve funds are sufficiently ample to take care of emergency situations of short duration. Why does the federal government proffer unneeded assistance? Also, why should one work if he can get 88 cents for loafing for every dollar he could earn working?

* * *

FIGHT OBSOLESCENCE: Since the first of the year there has been a noticeable change in the emphasis placed upon major aspects of the national economy. In January there was a tendency among Washington spokesmen to stress the need for more speed and volume in defense production. Civilian output was to be curtailed drastically. Now there seems to be an air of complacency about speed and volume for armament and a more liberal attitude toward "business as usual."

It would be natural to think that part of this change in emphasis stems from political considerations. Some of it does, undoubtedly, but a substantial factor probably is the rapid advance in the technology of weapons, which causes the military experts to fear they may "freeze" obsolete models.



NEW LINCOLN PLANT CREATED BY INCENTIVE-INSPIRED CO-ACTION IN DEVELOPING POSSIBILITIES IN PRODUCT

© LE Co. 1952

WELDED DESIGN IMPROVES APPEARANCE

. . . while cutting costs 50%

BY converting to welded steel, this progressive manufacturer has achieved a more modern, better selling appearance for his products. At the same time he has cut costs 50% on some components.

Pleasing appearance in a product generally indicates efficient use of materials in its design. With welded steel, cumbersome and often costly dead weight, inherent with gray iron, is essentially eliminated. Wall thicknesses in steel are of exact design size. In addition, steel can be shaped at low cost with simple shop equipment.

While attaining stronger, more rigid products, in addition to improved appearance, savings in materials alone often run as high as 85%. Your Lincoln representative can show you how to apply the cost-saving benefits of steel to your products. Call or write.

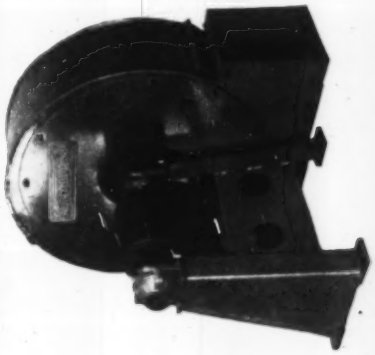


Fig. 3. Steel-Designed Blower *built by The Boardman Company, Oklahoma City, Oklahoma. Eliminates milling and drilling operations . . . is easier to clean and paint.*

Incentive Management—A thought-provoking approach to developing greater teamwork between employee and employer. Written by James F. Lincoln. Price only $1.00 postpaid in the U. S. A.; $1.50 elsewhere.

PROPER DESIGN IN WELDED STEEL ALWAYS IMPROVES PRODUCT AND LOWERS COST

Fig. 1. Original Construction. *Required 41% more metal than present welded steel design. Heavier weight with gray iron added to handling costs in shop, in shipping and final installation.*

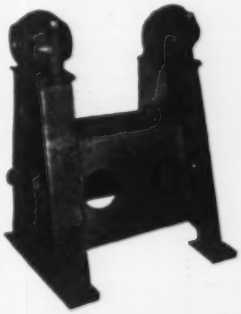


Fig. 2. Present Weldesign in Steel. *Saves 50% on cost. Has better appearance . . . greater selling appeal. Is stronger . . . more rigid.*

HERE'S MORE PROOF

Machine Design Sheets are available to designers and engineers. Write on your letterhead to Dept. 63.

THE LINCOLN ELECTRIC COMPANY

CLEVELAND 17, OHIO

The World's Largest Manufacturer of Arc Welding Equipment

Do you Recognize the Steel Parts Pictured Below?

They represent 9 reasons why you may still have trouble getting Inland Steel

In spite of Inland's record-shattering production year (12 all-time records were broken in 1951), Uncle Sam allocated much of the steel you needed to the Armed Services.

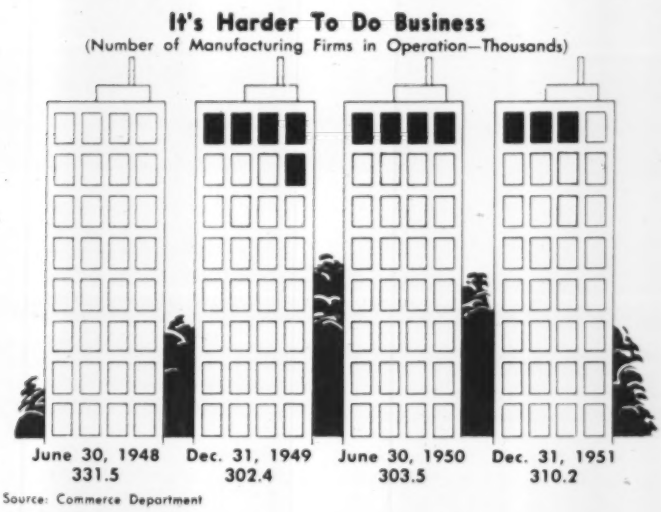
That's why Inland is adding capacity to give you the steel you need.

1. Section of aircraft landing mat
2. Ration cans
3. Frame for army cot
4. Aviation gas truck tank
5. 105 mm. howitzer gun tube
6. Barbed wire entanglement post
7. 5 gallon "Blitz" can for gas or water
8. Forging for 105 mm. shell
9. Fin assembly for 500 lb. cluster bomb

INLAND

INLAND STEEL COMPANY

38 South Dearborn Street • Chicago 3, Illinois



More Business—Fewer Companies

Shortages and controls cut the business population 6.4 per cent under 1948 highs while output rises 14 per cent. Labor ferment this year won't help the situation

IT WAS harder to do business in 1951 than in many former years, and the odds are it will be no picnic in 1952, either.

Materials shortages, the exasperation from controls and labor scarcities were among the major factors that held the company population to surprisingly low levels in 1951. Now that some of those problems are easing, a logical assumption could be that this year more new businesses will be formed and management headaches will be less severe. But labor ferment expected in coming months, plus a slackening in consumer durable sales and higher taxes, will probably cancel out the benefits from the improving factors in the economy.

Paradox — The accompanying chart shows that the number of manufacturing firms in operation today is 6.4 per cent below the 1948 peak even though industrial production now, according to the Federal Reserve Board index, is 14 per cent greater than in 1948. Usually the business population closely parallels general economic activity. In 1949, the chart shows the number of firms dropped 8.7 per cent from 1948. The FRB index slid a comparable 8.3 per cent in that period.

The number of companies in all industries now totals 3,991,200, says the Department of Commerce, compared with 4,010,200 in 1948. Of all the types of companies manufacturing, mining and quarrying, public utilities, wholesale trade, retail trade, finance, insurance, real estate, service and contract construction—only contract construction has gained markedly since 1948, largely because of the boom in house-building. Some 374,000 contract construction firms now exist, compared with 324,700 in 1948. Although some of the general drop can be accounted for by mergers, the declining rate of new stock incorporations and the steady pace of business failures determined much of the change. The 1951 incorporations hit 83,630, a six-year low that compares with 132,916 in 1946.

Far-Reaching — The labor unrest now brewing may not cause many business failures, but it won't encourage new incorporations over the rest of the year, either. The steel wage case, which will probably be settled by Mar. 23 when the latest strike truce expires, will set off a string of reactions. Once United Steelworkers of America-CIO gets its 217 basic steel contracts settled, it will ready demands, in most instances similar to those gained from basic steel, for its 2007 contracts negotiated with fabricating companies, can-producing firms and fringe units incidental to output of products made from steel and allied metals. Most of those contracts will expire in 1952.

Effects of the steel settlement will then fan out throughout the year to other CIO unions and eventually to all the 15 or 16 million organized workers in the U. S. Those companies that will be most severely affected will be defense producers. Even the 30 million non-agricultural workers in the U. S. who are unorganized (mostly in small plants or service industries) will feel by late this year the weight of the steel formula if their companies are in defense-related work.

Other Troubles — Escalator contracts are already bringing strain. Last week General Motors Corp. gave 301,000 hourly employees an additional 3 cents per hour cost-of-living allowance effective with the pay period beginning after Mar. 1.

Besides the labor factor, companies will have to pay higher taxes in 1952; the increased rates passed in 1951 applied for only part of that year, but all of this. What's more, consumer durable demand is sluggish. Physical volume of retail sales in 1951 fell 4 per cent below 1950 levels. All that adds up to this: Business in 1952 will be comparatively good, but getting it and doing it will be no beer and skittles.

IUE Hits General Electric

Another cost-of-living wage boost, among other demands, will be sought by the CIO International

Union of Electrical Workers from General Electric Co. So says James B. Carey, president of the electrical union. The new demands will be presented under a wage re-opening contract clause when talks start March 5 in New York. Less than three weeks ago, the Wage Stabilization Board approved a 1.08 per cent cost-of-living increase for GE workers; the increase was part of a 3.58 per cent wage increase agreed on in the union contract last September. The WSB has not acted on the remaining 2.5 per cent, although both company and union requested granting of the 3.58 per cent figure.

Other demands, said the union, would be: Minimum hourly wage of $1.25, productivity pay wage of 2 or 3 per cent and welfare improvements including at least $125 a month at the age of 65.

More Than Expected

NPA surveys 11,000 metalworking companies, finds employment is rising

EMPLOYMENT in the metalworking industry has been steadily increasing since December and is expected by employers to continue up through March, according to a telegraphic survey made by the Bureau of Labor Statistics for the National Production Authority.

The survey was required: To ascertain the effect of sharply reduced allotments of critical materials for civilian production during the first quarter of 1952 as compared with the last quarter of 1951; to find the change in employment in the metalworking industry between the two quarters occasioned by the material cutbacks, and to aid the NPA and the DPA in reviewing second quarter allotments for the third quarter.

Big Coverage—It covered approximately 11,000 establishments employing about 85 per cent of the labor force in the metalworking industry. Employment in the 105 metalworking industries surveyed was 4,962,000 in January, an increase of 22,000 employees over December. That is higher than during any month since the beginning of Korean hostilities. Employment in consumer durable goods industries which were generally most affected by material cutbacks is higher than during any period since the spring of 1951 when substantial diversion of materials from civilian to defense use was first felt.

Of the concerns who replied to this, and it was almost a 100 per cent response, metalworking companies employing fewer than 100 workers expect an increase over this period, December to March, of 5 per cent in number of employees while the metalworking companies employing fewer than 500 employees expect an increase over the same period of about 4 per cent.

FACE LIFTING: On a subcontract basis, Bethlehem-Pacific Coast Steel Corp., San Francisco, is face milling and profiling periscope ports in hatch castings for new-type personnel carriers. Primary contractor for the combat vehicles is Food Machinery & Chemical Corp., San Jose, Calif.

Flashlight Production Increases

Despite restrictions on brass consumption, battery-operated portable lighting equipment production reached a high for 1951 in the fourth quarter. The Portable Electric Light and Flashlight Case Manufacturers Industry Advisory Committee learned that shipments totaled $7.4 million including $1.2 million worth of military purchases during fourth quarter. Members of the committee reported that there have been no layoffs in the industry because of the adoption of plastics and steel to replace copper. Also, shifts in manufacture have taken up some of the slack.

Pre-fabs Near Peak at 50,000

Homebuilders faced with materials controls and rising construction costs are turning more to the prefabrication industry for new houses. The industry sold 50,000 dwellings in 1951, having an estimated value of $382.6 million, exclusive of land. Prefabricated houses accounted for nearly 6 per cent of all new single family homes in nonfarm areas in the U. S. built in 1951, says Prefabricated Home Manufacturers' Institute.

This year the industry expects to match its 1950 peak year of 55,000 dwellings. With a third of the homes built in 1952 located in defense areas, says the institute, there will be a continued heavy demand for prefabricated homes, for they can be erected quickly and with savings in materials and manhours.

More Rail Expansion: New Rates

In the next two years, the railroad industry should spend $2.18 billion if their earnings permit and the materials are available, estimates William T. Faricy, president of the Association of American Railroads.

Mr. Faricy, appearing before the Interstate Commerce Commission in support of the railroads' request for increased freight rates, cited the need for 200,000 new freight cars and about 7000 new locomotives within the next two years.

Economy in Taconite

Taconite processors have an improved technique which makes it more economical to process the hard stone containing 24 to 30 per cent iron. The new technique consists primarily of finer temperature control and more exact distribution and ratio of fuel and air in a taconite "pelletizing" furnace, says John R. Green of Minneapolis-Honeywell Regulator Co.

Assured of proper ratio of fuel and air in the furnaces, processors can deliver an ore with physical and chemical characteristics that equal those of higher grade ore.

Issue in 1952: Sales, Not Production

That's the appraisal of Westinghouse President Gwilym Price who says that "straws in the wind indicate scarce materials are becoming more readily available"

"OUR MAJOR problem in 1952 will be sales, not production." So says Gwilym A. Price in commenting on the outlook for Westinghouse Electric Corp., of which he is president.

By redesigning its products to save on critical materials, the company last year was able to produce consumer goods at a level approximating the record volume of 1950 and amounting to more than 26 per cent of all the company's 1951 sales.

Optimistic—Prospects for appliances, radios and television sets in 1952 are surprisingly good, says Mr. Price, even though copper and aluminum allocations in the second quarter will sink to a new low, about 14 per cent under the allotments for this period. Consumer durable production is heaviest in the third and fourth quarters, anyway, and by that time allotments should be higher because "a number of straws in the wind indicate that scarce materials are becoming more readily available." Mr. Price believes that business in consumer durables over the next 15 years will expand more than in the past 15 years. Air conditioning, he thinks, will be one of the big consumer durable sales items within the next decade.

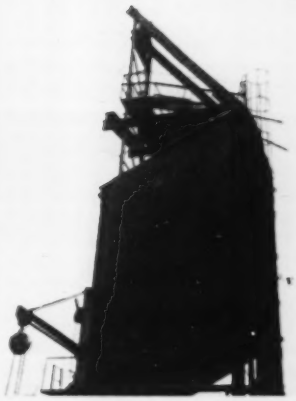
In the area of defense and defense-supporting production, Westinghouse foresees greater activity this year than last. Its backlog of defense orders at the end of 1951 represented more than 40 per cent of all unfilled orders. Actual defense production in 1951 was 6 per cent of total output.

Expansion—A substantial portion of the $296 million expansion program, which will extend through 1954, is designed for peacetime use but will be devoted to military production for the duration. Mr. Price believes that the electrical industry is expanding about three times faster than general industry.

The company's net sales in 1951 were a record $1,240,801,000—22 per cent above the 1950 level. But because of taxes net income dropped 17 per cent from 1950 to 1951, to $64,578,000. Westinghouse paid $104 million in taxes last year, compared with $77 million in 1950.

More Copper for Toys Unlikely

The pinch in the toy market is not likely to let up much in the near future even though manufacturers stand a better chance of getting increased allotments of steel. Copper, a controlling material in some toys and games, and aluminum will continue to be tight, says the National Production Authority. The industry employs about 50,000 persons and produces goods valued at $800 million retail a year.



SKIP HOIST SCRAPPED: Packard Motor Car Co. adds this 60-foot, 50-ton skip hoist to its scrap pile which now totals nearly 5 million tons. Much of the scrap metal will go into tools and dies to produce General Electric J-47 turbo-jet engines being manufactured by Packard. The hoist was part of an obsolete loading system

WSB Rules on Commission Earnings, Retirement Plans

POLICIES on commission earnings and retirement and profit-sharing plans are formalized by two rulings of the Wage Stabilization Board.

General Wage Regulation 20 adapts Regulations 6 and 8 to commission earnings. This permits a wage adjustment of 10 per cent over the level of January, 1950, and an increase to equal the rise in the cost of living since Jan. 15, 1951, as reflected by the Bureau of Labor Statistics Consumers' Price Index.

These adjustments will apply both to fixed salary and commission portions of employee earnings without approval of the board. However, increases in commission rates will require approval.

Safeguards—General Wage Regulation 21 places certain safeguards on pensions and profit-sharing plans, but it does not limit how much the company contributes to such plans or how much is to be paid to workers or their beneficiaries. The ruling of the board was unanimous.

For pension plans, the board ruled that an employee must be 65 years old or, if younger, that the benefits be scaled down. Payments must be over the lifetime of the retired worker except in cases of death benefits.

Two Decades—An employee may not become eligible for profit-sharing until ten years after becoming a member of the plan, and benefits must be paid over a period of another ten years.

The new regulation does not affect plans in operation prior to Jan. 25, 1951. It will make possible quick action on about 500 plans already submitted to the board for approval.

ACF Takes to the Air

American Car & Foundry Co. will fabricate sub-assemblies for the B-47 jet for the Douglas Aircraft Co. The sub-assembly will consist of the aft section of the fusilage which will be shipped later for final assembly elsewhere.

The B-47, the fastest bomber now in commercial production for the Air Force, is equipped with six J-47 turbo-jet engines which brings the speed into the 600 mph bracket.

Token Tale: Good Luck

Companies making the amulets of industry are again looking for ways around lack of metals

HEADS YOU WIN, tails you win in the token industry. In nearly all cases you win good luck, good fortune or a one way ride on your local transit system.

Whatever a token's message may be — identification, advertising, commemoration, company script or a transit fare—it is the product of a hardy, diversified industry which has little in common except its end product.

On the Side—Of the 500 firms doing 90 per cent of the token making business, most operate on a small side-line basis. Requiring only light stamping equipment, 400 or more firms make marking devices and from 100 to 250 firms make advertising or "service" pieces. These tokens are never made in the same size or weight as coins which are legal tender. There's a law against it. And usually they're made of aluminum, bronze, or nickel silver.

In normal times about 90 per cent of production at Osborne Coinage Co., Cincinnati, is made up of metal coins. Osborne, one of the largest token makers, is among the handful of firms to make coins a major product line; more than 200 million pieces are turned out in an average year. During World War II, when the company's entire metal production was stopped, Osborne manufactured all the United States and Canadian fibre ration tokens—some 5 billion of them.

The Defense Shift—At present NPA restrictions have cut heavily into metal supplies for token production and makers are forced to defense or defense-supporting work requiring stamping operations. Osborne, for example, is producing Army insignia, belt buckles, mountain climbing equipment and parachute harness equipment.

Current conditions in the "good luck to you" industry have resulted in many of the smaller shops dropping out of the picture entirely. They'll be back when metal becomes freer and business firms begin again to make "token" gestures of good will.

Bethlehem Has Record Year

Bethlehem Steel Corp. attained a record production of 16,405,677 ingot tons in 1951, says E. G. Grace, chairman. Output for the year was 102.5 per cent of rated capacity.

The corporation's rated annual steelmaking capacity as of Jan. 1, 1952 was 16.8 million tons compared to 16 million tons on Jan. 1, 1951. By the end of 1953, projected expansion should bring steel ingot capacity up to 18.4 million tons. Other expansion programs are under way for coal chemical producing facilities and coke ovens, shipbuilding and ship repair yards and development of iron ore mines at Morgantown, Pa., Marmora, Ont., Romeral, Chile, and the El Pao mines in Venezuela.

Tennessee Steel Begins Work

Initial work in construction of a steel plant for Tennessee Steel Corp., a new company, is under way at Oneida, Tenn. Ground is being cleared and an access road and an access bridge are being built. The property adjoins the Oneida & Western Railroad.

The plant will have for production purposes two electric steelmaking furnaces, each with a capacity of 40 tons per heat. For research purposes the plant will have one electric steelmaking furnace with a capacity of one-half ton per heat. The plant's annual capacity for producing new steel will be 192,000 tons. In addition, the plant will have a rail rerolling capacity of 35,000 tons annually.

STRONGER THAN STEEL: Titanium, which looks like a sponge but definitely is not, is being produced by Titanium Metals Corp. of America at Henderson, Nev. George W. Llewellyn, left, of the H. K. Ferguson Co., industrial engineers, and R. P. Smith, plant manager, study the metal which is half as heavy as steel but about twice as strong

Steel: Past, Present, Pending

Jan. 1, 1951	Units	Capacity (Net Tons)
Open Hearth	946	91,305,980
Bessemer	41	5,621,000
Electric	237	7,112,826
Total		104,039,806

Jan. 1, 1952	Units	Capacity (Net Tons)
Open Hearth	939	95,028,146
Bessemer	38	5,381,000
Electric	244	8,133,724
Total		108,542,870
Capacity being added		10,907,561
Total capacity (1953)		119,450,431

Disston May Revamp Furnaces

Conversion of its two electric steelmaking furnaces from side charging to top charging is being considered by Henry Disston & Sons Inc., Tacony, Philadelphia.

The furnaces are located at Tacony. One of them has an annual capacity of 16,400 net tons, and the other, 8600 tons. Conversion of the furnaces would increase capacity approximately 5000 tons a year.

Kropp Forges Titanium

Titanium bar forgings with surface finishes are being turned out for industrial and rearmament uses by Kropp Forge Co. The heat-resistant metal, says the company, is alloyed in processing, for titanium doesn't yield its most desirable qualities in pure state. The alloy is dictated largely by the function of the end product.

SPECIAL REPORT

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Republic Steel Photo

BUILD-UP IN STEEL

. . . inventory of capacities, present and pending

STEEL this week brings you a detailed and exclusive report on the nation's expansion in steel ingot and pig iron production facilities.

This report reveals publicly for the first time the steel ingot and pig iron capacities by plants as of Jan. 1, 1952, along with Jan. 1, 1951, figures for comparative purposes. The report also shows what expansions are under way now or are projected.

STEEL's report accounts for 108,542,870 net tons of ingot capacity and 73,412,998 net tons of blast furnace capacity as of Jan. 1, 1952. These figures are almost identical with totals announced by the American Iron & Steel Institute. It reported ingot capacity of 108,587,670 tons and blast furnace capacity of 73,782,340 tons as of Jan. 1, 1952.

Preview of '53—Additions planned or being made to ingot capacity will give a net increase of 10,907,561 tons over that of Jan. 1, 1952, STEEL's survey shows. This would bring ingot capacity to 119,450,431 tons in 1953. This is in line with what the institute has expected for 1953, approximately 120 million tons.

Similarly, STEEL's survey reveals expansions being made or planned will boost blast furnace capacity to 80,688,198 tons. The institute had announced that it expects blast furnace capacity will rise to at least 81 million tons by the start of 1954.

Change of Pace—Not many more announcements of ingot facility expansions are likely. Most of the attention henceforth likely will be

STEEL INGOT CAPACITY BY TYPE, COMPANY AND PLANT LOCATION

	Jan. 1, 1951			Jan. 1, 1952		
	OPEN HEARTH Units—Capacity annually, net tons	BESSEMER Units—Capacity annually, net tons	ELECTRIC Units—Capacity annually, net tons	OPEN HEARTH Units—Capacity annually, net tons	BESSEMER Units—Capacity annually, net tons	ELECTRIC Units—Capacity annually, net tons
Alan Wood Steel Co.						
Ivy Rock, Pa.	7— 550,000			8— 625,000		
Allegheny Ludlum Steel Corp. (Total)	6— 260,160		28— 572,200	5— 240,000		28— 619,200
Ferndale, Mich.			5— 3,000			5— 3,000
Dunkirk, N. Y.			3— 33,000			3— 33,000
Tonawanda, N. Y.			2— 4,500			2— 4,500
Watervliet, N. Y.			3— 25,000			3— 72,000
Brackenridge, Pa.	6— 260,160		15— 506,700	5— 240,000		15— 506,700
American Locomotive Co. (Total)	6— 181,000			6— 181,000		
Chicago Heights, Ill.	3— 78,000			3— 78,000		
Latrobe, Pa.	3— 103,000			3— 103,000		
Armco Steel Corp. (Total)	39— 3,934,000		9— 396,000	39— 3,979,000		10— 546,000
Ashland, Ky.	8— 900,000			8— 860,000		
Baltimore, Md.			6— 102,000			6— 102,000
Middletown, O.	11— 1,312,000		2— 228,000	11— 1,277,000		2— 228,000
Butler, Pa.	6— 408,000		1— 66,000	6— 408,000		1— 66,000
Sheffield Steel Corp.						
Kansas City, Mo.	5— 420,000			5— 480,000		
Sand Springs, Okla.	1— 54,000			1— 54,000		
Houston, Tex.	8— 840,000			8— 900,000		1— 150,000
Atlantic Steel Co.						
Atlanta, Ga.	3— 188,000			3— 188,000		
Babcock & Wilcox Co.						
Beaver Falls, Pa.			2— 64,800			3— 133,450
Baldwin-Lima-Hamilton Corp.						
Burnham, Pa.	5— 149,280		1— 20[1]	5— 169,920		1— 20[1]
Barium Steel Corp. (Total)	13— 840,030		1— 46,000	13— 840,030		1— 46,000
Central Iron & Steel Co.						
Harrisburg, Pa.	5— 360,000		1— 46,000	5— 360,000		1— 46,000
Industrial Forge & Steel Co.						
Canton, O.	2— 48,600			2— 48,600		
Phoenix Iron & Steel Co.						
Phoenixville, Pa.	6— 431,430			6— 431,430		
Bethlehem Steel Corp.						
Bethlehem Steel Co. (Total)	122—14,486,000	6— 576,000	8— 158,000	123—15,466,000	3— 336,000	8— 158,000
Lackawanna, N. Y.	30— 3,920,000			30— 4,020,000		
Bethlehem, Pa.	32— 2,922,000		8— 158,000	32— 2,970,000		8— 158,000
Johnstown, Pa.	21— 1,788,000	3— 240,000		21— 2,100,000		
Steelton, Pa.	11— 1,032,000			12— 1,312,000		
Sparrows Point, Md.	28— 4,824,000	3— 336,000		28— 5,064,000	3— 336,000	
Bethlehem Pacific Coast Steel Corp. (Total)	13— 540,000		2— 240,000	10— 456,000		3— 384,000
Los Angeles	3— 84,000		2— 240,000			3— 384,000
South San Francisco	5— 240,000			5— 240,000		
Seattle, Wash.	5— 216,000			5— 216,000		
Botardi Steel Corp.						
Milton, Pa.			2— 50,760			2— 53,675
Borg-Warner Corp.						
New Castle, Ind.			3— 28,350			3— 30,000
Braeburn Alloy Steel Corp.						
Braeburn, Pa.			2— 20,730			2— 20,730
Byers Co., A. M.						
Harmony Township, Pa.			2— 75,000			2— 75,000
Carpenter Steel Co.						
Reading, Pa.			7— 81,360			7— 81,360
Colorado Fuel & Iron Corp. (Total)	27— 2,028,000			27— 2,028,000		
Pueblo, Colo.	16— 1,320,000			16— 1,320,000		
Tonawanda, N. Y.	4— 240,000			4— 240,000		
Claymont Steel Corp.						
Claymont, Del.	7— 468,000			7— 468,000		

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Steel Ingot Capacity (continued)

	Jan. 1, 1951						Jan. 1, 1952					
	OPEN HEARTH		BESSEMER		ELECTRIC		OPEN HEARTH		BESSEMER		ELECTRIC	
	Units	Capacity annually, net tons	Units	Capacity annually, net tons	Units	Capacity annually, net tons	Units	Capacity annually, net tons	Units	Capacity annually, net tons	Units	Capacity annually, net tons
Columbia Tool Steel Co.												
Chicago Heights, Ill.					2	6,000					2	6,000
Comfort Steel Co.												
Birmingham, Ala.					2	60,000					2	60,000
Continental Steel Corp.												
Kokomo, Ind.	3	345,700					3	394,000				
Copperweld Steel Co.												
Warren, O.					2	554,400					2	554,400
Crucible Steel Co. of America (Total)	11	962,000			24	276,400	10	61,000			25	331,560
Harrison, N. J.					12	2,160					12	2,160
Syracuse, N. Y.					6	56,250					6	59,600
Midland, Pa.	11	962,000			6	228,000	10	61,000			5	270,000
Damascus Tube Co.												
Greenville, Pa.					1	1,000					1	1,000
Detroit Steel Corp.												
Portsmouth, O.	10	660,000					10	660,000				
Disston & Sons Inc., Henry												
Philadelphia, Pa.					2	25,000					2	25,000
Eastern Stainless Steel Corp.												
Colgate, Md.					4	12,000					4	14,400
Edgewater Steel Co.												
Oakmont, Pa.	3	145,620					3	146,640				
Empire Steel Co.												
Mansfield, O.	6	300,320					7	470,320				
Erie Forge Co.												
Erie, Pa.	3	90,000					3	234,000				
Firth Sterling Steel & Carbide Corp.												
McKeesport, Pa.					3	20,040					3	20,040
Ford Motor Co.												
Dearborn, Mich.	10	1,246,500			5	165,000	10	1,260,000			5	281,000
Granite City Steel Co.												
Granite City, Ill.	13	720,000					13	720,000				
Harrisburg Steel Corp.												
Harrisburg, Pa.	3	160,250					3	160,250				
Heppenstall Co.												
Pittsburgh, Pa.	2	29,850			1	3,000	2	29,850			1	3,000
Hoover Steel Corp.												
Oklahoma City, Okla.											1	14,400
Inland Steel Co.												
Indiana Harbor, Ind.	36	3,750,000					36	3,750,000				
International Harvester Co.												
South Chicago, Ill.	11	900,000					11	900,000				
Isaacson Iron Works												
Seattle, Wash.					2	120,000					2	120,000
Jessop Steel Co.												
Washington, Pa.					4	41,560					4	33,491*
Jones & Laughlin Steel Corp. (Total)	30	3,927,000	6	915,000	1	1,500	38	4,570,500	6	915,000	1	1,500
Cleveland, O.	9	945,000					11	1,155,000				
Aliquippa, Pa.	5	1,182,000	3	582,000			5	1,182,000	3	582,000		
Pittsburgh, Pa.	16	1,800,000	3	333,000	1	1,500	22	2,242,500	3	333,000	1	1,500
Joslyn Mfg. & Supply Co.												
Ft. Wayne, Ind.					3	37,500					3	37,500
Judson Steel Corp.												
Emeryville, Calif.	3	76,500					3	76,500				
Kaiser Steel Corp.												
Fontana, Calif.	7	1,200,000					8	1,350,000				
Keystone Steel & Wire Co.												
Peoria, Ill.	3	325,000					4	400,000				
Kilby Steel Co.					1	50,000					1	50,000
Anniston, Ala.					2	idle					2	idle
Knoxville Iron Co.												
Knoxville, Tenn.					2	38,000					2	38,000
Laclede Steel Co.												
Alton, Ill.	4	397,840					4	410,000				
Latrobe Electric Steel Co.												
Latrobe, Pa.					4	12,000					4	12,000
R. G. LeTourneau Inc.												
Longview, Tex.					1	5,000					1	5,000
Lukens Steel Co.												
Coatesville, Pa.	12	675,000					12	675,000				
McLouth Steel Corp.												
Trenton, Mich.					4	100,000					4	500,000
Mesta Machine Co.												
West Homestead, Pa.	1	85,000			1	20,000	1	85,000			1	20,000
Midvale Co.												
Philadelphia, Pa.	6	324,430			6	92,940	3	135,020			6	139,028
National Forge & Ordnance Co.												
Irvine, Pa.					3	25,000					3	30,000
National Steel Corp. (Total)	29	4,750,000	4*				30	5,020,000	4*			
Great Lakes Steel Corp.												
Ecorse, Mich.	17	2,450,000	2*				17	2,570,000	2*			
Weirton Steel Co.												
Weirton, W. Va.	12	2,300,000	2*				13	2,500,000	2*			
National Supply Co.												
Torrance, Calif.					3	50,400					3	50,200*
Newport Steel Corp.												
Newport, Ky.	7	413,100			3	291,600	7	413,000			3	291,600
Northwest Steel Rolling Mills Inc.												
Seattle, Wash.					1	32,400					1	32,400
Northwestern Steel & Wire Co.												
Sterling, Ill.					3	321,000					3	321,000
Ohio River Steel Corp.												
Toronto, O.	4	121,200					4	121,200				
Oregon Steel Mills												
Portland, Ore.					3	105,500					3	108,000
Pacific States Steel Corp.												
Niles, Calif.	2	140,000			2	91,300	2	140,000			4	182,600
Pittsburgh Steel Co.												
Monessen, Pa.	12	1,072,000					12	1,072,000				
Republic Steel Corp. (Total)	74	7,202,000	2	665,000	21	1,100,000	74	7,560,000	2	665,000	26	1,275,000
Gadsden, Ala.	3	243,000					3	280,000				
South Chicago, Ill.	4	500,000			3	600,000	4	532,000			3	600,000
Buffalo, N. Y.	3	370,000					3	392,000				
Canton, O.	6	475,000			12	500,000	6	450,000			17	675,000
Cleveland, O.	15	1,617,000					15	1,900,000				
Massillon, O.	9	610,000					9	620,000				
Youngstown, O.	15	1,465,000	2	665,000			15	1,477,000	2	665,000		
Warren, O.	3	300,000					3	300,000				

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Steel Ingot Capacity (continued)

	Jan. 1, 1951						Jan. 1, 1952					
	OPEN HEARTH		BESSEMER		ELECTRIC		OPEN HEARTH		BESSEMER		ELECTRIC	
	Units	Capacity annually, net tons	Units	Capacity annually, net tons	Units	Capacity annually, net tons	Units	Capacity annually, net tons	Units	Capacity annually, net tons	Units	Capacity annually, net tons
Roebling's Sons Co., J. A.												
Roebling, N. J.	9	185,000					9	204,870				
Rotary Electric Steel Co.												
Detroit, Mich.					5	420,000					5	425,000
Seidelhuber Steel Rolling Mill Co.												
Seattle, Wash.											1	75,000
Sharon Steel Corp. (Total)	18	1,381,400			2	60,000	18	1,447,000			2	72,000
Farrell, Pa.	14	981,400					14	1,069,000				
Lowellville, O.	5	400,000			2	60,000	5	478,000			2	72,000
Simonds Saw & Steel Co.												
Lockport, N. Y.					3	21,600					3	21,600
Stanley Works												
Bridgeport, Conn.	3	188,280					3	188,280				
Texas Steel Co.												
Ft. Worth, Tex.					2	22,320					2	22,320
Timken Roller Bearing Co.												
Canton, O.	3	201,600			6	345,600	3	201,600			6	345,600
Union Electric Steel Corp.												
Carnegie, Pa.					2	26,760					2	26,760
United States Steel Corp. (Total)	313	30,966,400	17	2,472,000	14	430,300	288	31,799,200	17	2,472,000	10	371,400
American Steel & Wire Div. (Total)	26	2,068,000					26	2,093,000				
Worcester, Mass.	4	250,000					4	275,000				
Duluth, Minn.	9	918,000					9	918,000				
Donora, Pa.	13	900,000					13	900,000				
Columbia-Geneva Steel Div. (Total)	20	2,096,400			1	12,000	21	2,166,400			1	12,000
Torrance, Calif.	4	201,700			1	12,000	4	201,700			1	12,000
Pittsburg, Calif.	7	364,700					7	364,700				
Geneva, Utah	9	1,440,000					10	1,600,000				
National Tube Div. (Total)	15	2,226,000	6	1,188,000			15	2,336,000	6	1,188,000		
Lorain, O.	12	1,350,000	3	900,000			12	1,400,000	3	900,000		
McKeesport, Pa.	3	876,000	3	288,000			3	936,000	3	288,000		
Tennessee Coal & Iron Div. (Total)	21	2,920,000	3[3]				21	3,027,000	3[3]			
Ensley, Ala.	9	1,368,000	3[3]				9	1,625,000	3[3]			
Fairfield, Ala.	12	1,352,000					12	1,402,000				
United States Steel Co. (Total)	231	21,746,000	8	1,284,000	13	418,300	215	22,176,800	8	1,284,000	9	359,400
South Chicago, Ill.	31	3,905,000	3	500,000	8	276,000	31	4,200,000	3	500,000	3	191,000
Gary, Ind.	55	6,025,700	3[3]				55	6,264,400	3[3]			
Youngstown, O.	15	1,700,000	2	784,000			15	1,962,000	2	784,000		
Braddock, Pa.	16	2,040,400					16	2,040,400				
Clairton, Pa.	12	870,000					12	900,000				
Duquesne, Pa.	27	1,800,000			4	142,800	27	1,900,000			4	160,000
Johnstown, Pa.	2	18,900			1	5,500	2	18,000			2	8,400
Munhall, Pa.	61	4,866,000					45	4,366,000				
Vandergrift, Pa.	12	480,000					12	530,000				
Universal Cyclops Steel Corp.												
Bridgeville, Pa.					4	54,120					5	70,160
Vanadium-Alloys Steel Co.												
Latrobe, Pa.					2[4]	11,910					2[4]	11,910
Monaca, Pa.					1[4]						1[4]	
Colonial Steel Co.												
Monaca, Pa.					1	7,020					1	7,020
Vulcan Crucible Steel Co.												
Aliquippa, Pa.					2	9,600					2	9,600
Washburn Wire Co.												
Phillipsdale, R. I.	4	93,000					4	93,000				
Wheeling Steel Corp. (Total)	11	1,440,000	2	420,000			11	1,440,000	2	420,000		
Benwood, W. Va.			2	420,000					2	420,000		
Steubenville, O.	11	1,440,000					11	1,440,000				
Youngstown Sheet & Tube Co. (Total)	33	3,680,000	4	570,000			33	3,800,000	4	570,000		
East Chicago, Ind.	9	1,196,000	2	330,000			9	1,196,000	2	330,000		
Campbell, O.	12	1,302,000	2	240,000			12	1,422,000	2	240,000		
Youngstown, O.	12	1,182,000					12	1,182,000				
Grand Total	946	91,305,980	41[3]	5,621,000	237	7,112,826	939	95,028,146	38[3]	5,381,000	244	8,133,724

(1) Crucible furnace. (2) Used in melting charge for open hearths. (3) Includes ten converters used only in melting charge for open hearths. (4) Decline due to use of American Iron & Steel Institute's new formula for reporting capacities.

on further additions to the country's blast furnace and rolling mill capacities and raw materials and refractory producing facilities.

The Defense Production Administration believes the country does not need more than 122 million tons of steel ingot producing capacity. On the other hand the DPA has a strong feeling that encouragement should be given to the building of additional blast furnace capacity, perhaps 2 million to 3 million tons more. The DPA also believes there will be need for additional steel finishing facilities, enlargement of raw materials supplies and expansion in the refractories field. Consequently, the DPA is reconsidering its policies of granting certificates of necessity for accelerated tax amortization on iron and steel and related facilities.

BLAST FURNACE CAPACITY BY PLANT LOCATION

	CAPACITY Jan. 1, 1951		CAPACITY Jan. 1, 1952		EXPANSION UNDERWAY OR PLANNED			TOTAL Anticipated Annual Capacity, net tons
	Stacks	Capacity annually, net tons	Stacks	Capacity annually, net tons	Stacks	Capacity annually, net tons	Completion Date	
Alan Wood Steel Co.								
Swedeland, Pa.	2	454,800	2	454,800	0			454,800
Armco Steel Corp.	7	1,642,000	7	1,641,000				2,295,000
Ashland, Ky.	3	777,000	3	777,000	0			777,000
Hamilton, O.	2	564,000	2	564,000	0			564,000
Middletown, O.	0		0		1	504,000	12/52	504,000
Sheffield Steel Corp.								
Houston, Tex.	1	274,000	1	300,000	0	60,000[5]	1952	360,000
Valencia Iron & Chemical Corp.								
Rusk, Tex.	1	27,000	1	not operable	0			
Barium Steel Corp.	1	200,000	1	200,000				776,000
Chester Blast Furnace								
Chester, Pa.	1	200,000	1	200,000	0			200,000
Central Iron & Steel Co.								
Harrisburg, Pa.	0		0		1	288,000	4/53	288,000
Phoenix Iron & Steel Co.								
Phoenixville, Pa.	0		0		1	288,000	4/53	288,000
Bethlehem Steel Corp. (Total)	31	10,350,000	31	10,400,000				11,200,000
Sparrows Point, Md.	8	3,252,000	8	3,252,000	1	600,000	1953	3,852,000
Lackawanna, N. Y.	6	2,472,000	6	2,472,000	1	500,000	1952	2,672,000
Bethlehem, Pa.	7	2,160,000	7	2,160,000				2,160,000
Johnstown, Pa.	7	1,674,000	7	1,674,000				1,674,000
Steelton, Pa.	3	792,000	3	842,000				842,000
Colorado Fuel & Iron Corp. (Total)	7	1,459,200	7	1,459,200				1,541,200
Pueblo, Colo.	4	918,000	4	918,000	1[6]	42,000	4thQ '52	960,000
Tonawanda, N. Y.	2	390,000	2	390,000		40,000	4thQ '52	430,000
Brooke Iron Div. (E. & G.)								
Birdsboro, Pa.	1	151,200	1	151,200	0			151,200
Crucible Steel Co.								
Midland, Pa.	2	532,000	2	535,000	1	360,000	3rdQ '52	895,000
Detroit Steel Corp.								
Portsmouth, O.	1	264,000	1	264,000	1	504,000	4thQ '52	768,000
Eastern Gas & Fuel								
Everett, Mass.	1	196,000	1	196,000	0			196,000
Ford Motor Co.								
Dearborn, Mich.	3	939,600	3	1,102,627	0			1,102,627

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Sizing Them Up—STEEL's survey shows 15 additional blast furnaces are being built or are being considered. Expansions under way and projected would increase blast furnace capacity 10 per cent over that on Jan. 1, 1952. Similarly, expansions in steelmaking facilities will put 1953 ingot capacity 10 per cent over the Jan. 1, 1952, capacity. Of these expansions, 80 per cent are in open-hearth capacity. Practically all of the other 20 per cent are in electric furnace capacity, with only a minor amount being in bessemer capacity.

In contrast, the expansion will raise open-hearth capacity only 10 per cent over Jan. 1, 1952, while electric furnace capacity will jump 30 per cent.

Steel Ingot Expansions

ARMCO STEEL CORP. will get 180,000 net tons of open-hearth steel annually at Middletown, O., because of increased hot metal supply sometime in December, 1952.

SHEFFIELD STEEL CORP. will get 150,000 net tons of steel at Kansas City, Mo., from one new electric furnace, in April, 1952.

ATLANTIC STEEL CO., Atlanta, will get an additional 108,000 net tons of steel annually from one new electric furnace in May, 1952.

BABCOCK & WILCOX CO., Beaver Falls, Pa., will have 68,650 additional tons of steel annually from one new electric furnace, in August, 1952.

CENTRAL IRON & STEEL CO., Harrisburg, Pa., will get 189,000 net tons of open-hearth steel annually from two new furnaces, in April, 1953.

PHOENIX IRON & STEEL CO., Phoenixville, Pa., will get 220,320 net tons of open-hearth steel annually from two new furnaces, in April, 1953.

BORG-WARNER CORP., New Castle, Ind., will get 35,000 tons of steel from two new electric furnaces, in 1952.

COLORADO FUEL & IRON CORP. will get 162,000 net tons of open-hearth steel annually at Pueblo, Colo., beginning in the fourth quarter of this year.

CLAYMONT STEEL CORP., Claymont, Del., will enlarge open hearths this year.

CONNORS STEEL CO., Birmingham, will add 20,000 net tons annually to its production with one new electric furnace, in March, 1952.

CONTINENTAL STEEL CORP., Kokomo, Ind., will enlarge furnaces and get 35,000 net tons of open-hearth steel annually by January, 1954.

CRUCIBLE STEEL CO. OF AMERICA, at its Midland, Pa., works, will get 105,000 net tons of open-hearth steel annually from new and enlarged furnaces, in the fourth quarter of 1952, and 42,000 net tons of steel annually from a new electric furnace, in the second quarter of 1952.

DETROIT STEEL CORP., Portsmouth, O., will get 630,000 net tons of open-hearth steel annually after January, 1953, through four new furnaces.

HENRY DISSTON & SONS INC., Philadelphia, will get 5000 net tons annually this year when it converts two electric furnaces to top charging.

EASTERN STAINLESS STEEL CORP., Colgate, Md., will get 3600 net tons annually from one new electric furnace, in September of this year.

EMPIRE STEEL CO., Mansfield, O., will get 80,000 net tons of open-hearth steel annually from one new furnace, in July of this year.

A. FINKL & SONS CO., Chicago, will get 60,000 tons of electric steel annually from two new furnaces, sometime this month.

FORD MOTOR CO., Dearborn, Mich., is converting one open hearth from tilting to stationary type, to be completed late this year. Ford will change charging facilities in its open-hearth shop in Dearborn next year.

GLOBE IRON CO., Jackson, O., will get 27,000 tons annually from a new electric furnace for silvery pig iron and ferroalloys, in April, 1952.

GRANITE CITY STEEL CO., Granite City

Continued on Page 180

BLAST FURNACE CAPACITY BY PLANT LOCATION

	CAPACITY Jan. 1, 1951 Stacks—Capacity		CAPACITY Jan. 1, 1952 Stacks—Capacity		EXPANSION UNDERWAY OR PLANNED Stacks—Capacity		Completion Date	TOTAL Anticipated Annual Capacity, net tons
		net tons		net tons		net tons		
Globe Iron Co.								
Jackson, O.	1	90,000	1	100,000	0			100,000
Granite City Steel Co.								
Granite City, Ill.	2	449,680	2	449,680	0			449,680
Inland Steel Co.								
Indiana Harbor, Ind.	8	2,638,950	8	2,638,950	0			2,638,950
Interlake Iron Corp. (Total)	6	1,244,860	6	1,298,270	0			1,532,770
Chicago, Ill.	2	448,020	2	448,020	1[3]	133,980	1st H. '53	582,000
Duluth, Minn.	1	131,660	1	131,670	0			131,670
Toledo, O.	2	497,600	2	551,000	0			551,000
Erie, Pa.	1	167,580	1	167,580	1[3]	108,520	Full '52	288,100
International Harvester Co.								
South Chicago, Ill.	3	719,710	3	734,389	0			734,389
Jackson Iron & Steel Co.								
Jackson, O.	1	93,000	1	93,000	0	9,300	1953	102,300
Jones & Laughlin Steel Corp. (Total)	13	4,212,000	13	4,212,000				4,312,000
Cleveland, O.	2	540,000	2	540,000	1[3]	100,000	4 '52	640,000
Aliquippa, Pa.	5	1,800,000	5	1,800,000	0			1,800,000
Pittsburgh, Pa.	6	1,872,000	6	1,872,000	0			1,872,000
Kaiser Steel Corp.								
Fontana, Calif.	2	876,000	2	876,000	1[3]			876,000
Kaiser & Frazer Parts Corp.								
Ironton, Utah	1	300,000	0[1]	0	0			112,000
Lavino & Co., E. J.	2	102,200	2	112,000				
Sheridan, Pa.	1	51,100	1	56,000	0			56,000
Lynchburg, Va.	1	51,100	1	56,000	0			56,000
Lone Star Steel Co.								
Lone Star, Tex.	1	366,600	1	366,600	0			366,600
National Steel Corp. (Total)	10	3,120,000	10	3,240,000				4,420,000
Great Lakes Steel Corp.					1	480,000	7 '52	
River Rouge, Mich.	3	1,100,000	3	1,200,000	1[3]	220,000	12/53	1,900,000
Hanna Furnace Corp.								
Buffalo, N. Y.	4	780,000	4	800,000	0			800,000
Weirton Steel Co.								
Weirton, W. Va.	3	1,240,000	3	1,240,000	1	480,000	Late '52	1,720,000
New Jersey Zinc Co.								
Palmerton, Pa.	1	65,000	1	65,000	0			65,000
Newport Steel Corp.								
Martins Ferry, O.	1	144,000	1	144,000	0			144,000
Pittsburgh Coke & Chemical Co.	2	474,100	2	474,100				745,700
Struthers, O.	1	182,500	1	182,500	0			182,500
Neville Island, Pa.	1	291,600	1	291,600	1	291,600	4th Q '52	583,200
Pittsburgh Steel Co.								
Monessen, Pa.	3	954,000	3	954,000	0			954,000
Republic Steel Corp. (Total)	21	6,592,000	21	6,765,000				7,242,000
Birmingham, Ala.	2	456,000	2	456,000	0			476,000
Gadsden, Ala.	2	471,000	2	471,000	0			471,000
South Chicago, Ill.	1	450,000	1	450,000	0			450,000
Buffalo, N. Y.	2	618,000	2	618,000	0			618,000
Troy, N. Y.	1	263,000	1	263,000	0			263,000
Canton, O.	1	235,000	1	235,000	0			235,000
Cleveland, O.	5	1,685,000	5	1,735,000	1	537,000	2nd Q '52	2,272,000
Massillon, O.	1	238,000	1	238,000	0			238,000
Warren, O.	1	516,000	1	516,000	0			516,000
Youngstown, O.	5	1,660,000	5	1,723,000	0			1,723,000
Sharon Steel Corp.	3	709,620	3	709,620				709,620
Lowellville, O.	1	148,620	1	148,620	0			148,620
Farrell, Pa.	2	561,000	2	561,000	0			561,000
Shenango Furnace Co.								
Sharpsville, Pa.	2	417,300	2	417,300	0			417,300
Sloss-Sheffield Steel & Iron Co.	4	423,270	4	491,710	0			491,710
Birmingham, Ala.	2	281,230	2	281,230	0			281,230
North Birmingham, Ala.	2	142,040	2	210,480	0			210,480
Tennessee Prod. & Chem. Corp.	3	142,510	3	220,320				220,320
Lyles-Wiggley, Tenn.	1	40,320	1	40,320	0			40,320
Rockwood, Tenn.	2	102,190	2	180,000	0			180,000
Tonawanda Iron Division (American Radiator & Standard Sanitary Corp.)								
North Tonawanda, N. Y.	1	171,000	1	171,000	0			171,000
United States Steel Corp.	81	26,180,600	82	26,600,300	0			28,137,100
American Steel & Wire Div. (Total)	6	1,429,400	6	1,429,400				1,429,400
Duluth, Minn.	2	449,400	2	449,400	0			449,400
Cleveland, O.	2	530,000	2	530,000	0			530,000
Donora, Pa.	2	450,000	2	450,000	0			450,000
Columbia-Geneva Steel: (Total)	4	1,399,200	5	1,682,700	0			1,682,700
Geneva, Utah	3	1,200,000	3	1,200,000	0			1,200,000
Ironton, Utah	1	199,200	2[4]	482,700	0			482,700
National Tube: (Total)	9	3,098,700	9	3,122,800				3,122,800
Lorain, O.	5	1,818,400	5	1,842,500	0			1,842,500
McKeesport, Pa.	4	1,280,300	4	1,280,300	0			1,280,300
Tennessee Coal & Iron: (Total)	9	2,497,500	9	2,497,500				2,900,300
Fairfield, Ala.	3	1,015,700	3	1,015,700	0	402,800	1953	1,418,500
Ensley, Ala.	6	1,481,800	6	1,481,800	0			1,481,800
United States Steel: (Total)	53	17,755,900	53	17,867,900				19,001,900
South Chicago, Ill.	11	4,196,700	11	4,196,700	0			4,196,700
Gary, Indiana	12	4,721,400	12	4,721,400	0			4,721,400
Youngstown, O.	6	1,861,600	6	2,003,700	0			2,003,700
Braddock, Pa.	7	2,602,700	7	2,602,700	0			2,602,700
Clairton, Pa.	3	614,000	3	614,000	0			614,000
Duquesne, Pa.	6	1,451,400	6	1,451,400	0			1,451,400
Etna, Pa.	2	145,000	2	145,000	0			145,000
Morrisville, Pa.	0	0	0	0	2	1,134,000	3rd Q '52	1,134,000
Rankin, Pa.	6	2,133,000	6	2,133,000	0			2,133,000
Wheeling Steel Corp.	6	1,678,500	6	1,678,500				1,678,500
Steubenville, O.	5	1,444,500	5	1,444,500	0			1,444,500
Benwood, W. Va.	1	234,000	1	234,000	0			234,000
Woodward Iron Co.								
Woodward, Ala.	3	592,760	4	772,632	0			772,632
Youngstown Sheet & Tube (Total)	12	3,616,000	12	3,616,000				4,116,000
South Chicago, Ill.	3	684,000	3	684,000	0			684,000
East Chicago, Ind.	2	779,200	2	779,200	1	500,000	8 '52	1,279,200
Campbell, O.	4	1,450,800	4	1,450,800	0			1,450,800
Hubbard, O.	1	200,400	1	200,400	0			200,400
Youngstown, O.	2	501,600	2	501,600	0			501,600
Grand Total	248	72,411,260	249	73,412,998		7,275,200[8]		80,688,198

(1) Furnace enlargements. (2) Kaiser & Frazer Parts Corp. stack now leased and operated by Columbia-Geneva Steel Division, U. S. Steel Co. (3) Richer ore to be used. (4) Due to improved practice. (5) Being considered. (6) Furnace replacement. (7) Estimated by STEEL; Bethlehem Steel Co. estimates capacity on Jan. 1, 1953, at 11 million net tons. (8) Net addition.

CHECKLIST ON CONTROLS

GOVERNMENT control orders are digested or listed each week in this "Checklist on Controls." For complete copies of NPA orders, write to NPA Distribution Section, First Basement, New GAO Bldg., Washington 25. For copies of OPS orders, contact nearest OPS district or regional office. For copies of OPS news releases, write David S. Phillips, director, OPS Administrative Services Division, Temporary E Bldg., Washington 25.

Materials Orders

RUBBER — Amendment of Feb. 26, 1952, of NPA Order M-2 permits exporters to purchase up to $100 worth of GR-S (general-purpose) synthetic rubber without obtaining a validated export license from the Office of International Trade, Department of Commerce.

STORAGE BATTERIES—NPA Order M-93, which was a measure to conserve lead by limiting production of electric storage batteries to models having life expectancies of at least 18 months and by prohibiting output of high ampere-hour "deluxe" models, was revoked Feb. 26, 1952. The order was issued last December. Since then, the U. S. lead supply improved substantially because of increased imports caused by the drop in the price of foreign lead and because of the increased flow of scrap. NPA also revealed that its order M-38, a general limitation on the use of lead, is being relaxed.

Solar Wins $13 Million Job

Solar Aircraft Co. has received a $13 million order for the manufacture of jet engine parts. The company will manufacture afterburners, combustion chambers and other "hot" parts at its new plant in Des Moines, Iowa. The order was in the form of a letter of intent from the Lincoln-Mercury Division of Ford Motor Co. Ford is authorized by the Westinghouse Electric Corp. to make the engines.

Taylor Wants Write-off Changes

Small businesses will be assured of a larger share of tax amortization if the Defense Production Administration adopts two recommendations offered by Small Defense Plants Administrator Telford Taylor. In a speech before the Smaller Manufacturers Council of the Pittsburgh Chamber of Commerce, Mr. Taylor said that DPA should establish a "set-aside" within any projected industrial expansion program to be held for a reasonable time for small business.

Secondly, Mr. Taylor favors a method to provide for better, separate treatment of applications for certificates of necessity from small businesses.

WELL OILED JETS: A quantity of high precision lube oil pumps built for jet plane engines awaits the inspection of Arthur Nichols, right, co-owner of the W. H. Nichols Co., Waltham, Mass. The Nichols firm, employing 450 persons, subcontracts for the jet oil pumps from the General Electric Co.

Military Electronics: The Order Pace Quickens

SUBCONTRACTORS can expect higher voltage activity in electronics because of larger military orders for the equipment. The Armed Forces electronics program is now at an annual going-rate of more than $1.5 billion with signs of a $1 billion increase by mid-summer. The program will probably reach a $3.5 billion peak at the end of 1953, says Radio-Television Manufacturers Association.

An example of recent expansion may be seen in the announcement of the leasing of two plants by the Westinghouse Electric Corp. to manufacture Hipersil wound cores for electronic transformers. Production at the plants, located at Greenville, Pa., and Lima, O. is slated to begin March 1.

Aside from military and civilian programs, defense-supporting programs are expected to further the electronics expansion program in the next few years. Other contracts:

Product	Contractor
Shells, 75 MM	York Electrical & Machine Co., York, Pa.
Shells, HEI, M97	Harvey Machine Co., Torrance, Calif.
Boosters	Clary Multiplier Corp., San Gabriel, Calif.
	Webster, Warren Co., Camden, N. J.
Fuses	Regina Corp., Rahway, N. J.
	A. C. Gilbert Co., New Haven, Conn.
MPTS for fuses	Harvey Machine Co., Torrance, Calif.
Guns, 20 MM M3	Crown Cork & Seal Co., Baltimore
Recoilless Rifles	Firestone Tire & Rubber Co., Akron
Gun Parts (2 Contracts)	Crown Cork & Seal Co., Baltimore
Tube forgings for Howitzers	Bethlehem Steel Co., Bethlehem, Pa.
Breech ring castings	Ohio Steel Foundry Co., Lima, O.
	National Supply Co., Torrance, Calif.
Cartridge cases (2 Contracts)	Rheem Mfg. Co., New York
Rocket Assemblies	Oldsmobile Div., General Motors Corp., Detroit
Jacket Forgings for 120 MM Gun	Fairmount Steel Corp., Philadelphia
Assemblies for Shells	G. M. Co. Mfg. Inc., Long Island City, N. Y.
Bulldozers	Miller & Smith Mfg. Co. Inc., Phoenix, Ariz.
Trailers	ACF-Brill Motors Co., Philadelphia
Truck Parts	J. H. Nolan Corp., Cleveland
Model Drive Transmissions	Allison Div., General Motors Corp., Detroit
Kit Heaters (2 Contracts)	Perfection Stove Co., Cleveland
Parts for Heat Exchangers	Harrison Radiator Div., General Motors Corp., Detroit
Parts for Diesel Engines	Fairbanks, Morse & Co., Chicago
Diesel Engines	Cleaver-Brooks Co., Milwaukee
Pump assemblies	Crane Co., Chicago
Oxygen Cylinders	Harrisburg Steel Corp., Harrisburg, Pa.
Steel Tanks	Black, Sivalls & Bryson Inc., Kansas City, Mo.
Telephone Sets	Conn. Telephone & Electric Corp., Meriden, Conn.
Telegraph Terminals	Federal Telephone Radio Corp., Clifton, N. J.
Teletypewriter Sets	National Cash Register Co., Dayton, O.
	Kleinschmidt Labs. Inc., Deerfield, Ill.
Radio Sets	Admiral Corp., Chicago
Crystal Units	Electrical Products Co., Oakland, Calif.
	Bulova Watch Co., New York
Oxygen Regulators for Aircraft	Eclipse-Pioneer Div., Bendix Aviation Corp., Detroit
Aircraft Parts (5 Contracts)	Pratt & Whitney Div., United Aircraft Corp., W. Hartford, Conn.

Windows of Washington

By E. C. KREUTZBERG Washington Editor

Congress, dissatisfied with defense spending, wants to know why we haven't produced more defense items to date. One answer: Too many irons in the fire

LOOK FOR the Lyndon Johnson subcommittee to bring forth within "a few weeks" critical and suggestive answers to the rising inquiry in Congress: Why haven't we got more defense right now than we were led to expect?

The unsatisfactory defense dollar picture is throwing the whole subject of defense production into sharpened focus. On June 30, 1952, the Defense Department will wind up the current fiscal year with unexpended appropriations—some of which were approved back in October of 1950—of $75 billion. Thus, unexpended funds at the beginning of the next fiscal year will be in the neighborhood of $130 billion if the President's budget request is passed by Congress as some observers expect.

A What-Dun-it—What is holding up delivery of military items? Is it the fact that we are loathe in this limited emergency to interfere with the civilian economy? Is it unintelligent or impractical planning? Is it shortage of labor, machine tools, components?

The Lyndon Johnson group thinks that perhaps we have too many defense irons in the fire. Maybe, the group reasons, the time has come to give one or more programs a real No. 1 spot, deferring lesser programs that may be holding up the No. 1 items. This thinking was strengthened substantially by the recent keen analysis of Air Force Secretary Finletter. He made a strong case for air strength—not only as the outstanding need for defense and offense, but also for its value as a deterrent to all-out war.

Heavy Time Lag—Finletter reported it now takes 17 to 31 months to get delivery in reordering standardized and accepted aircraft.

The time factor is even more of an obstacle to the huge volume of development work still to be done in the fields of jet propellants, atomic weapons and automatic guidance of missiles.

It is too early to predict what the Johnson group will recommend, and Congress approve. But out of the present critical sleuthing may come an adjustment in production schedules of vital import to industry.

Unemployment: Profit, Loss

THE MOODY-DINGELL bill to supplement state unemployment benefits with federal funds might cost the government well over $1 billion a year, Frank B. Cliffe, vice president, H. J. Heinz Co., told the Senate Finance Committee.

Under the bill, he said, a single man earning $60 a week would receive unemployment compensation (state and federal) of $53 a week—so there would be little incentive for an idle man to go out and seek a job.

How To Use an Atom . . .

To hasten development of atomic weapons, the Air Force has merged into the Air Research and Development Command, Baltimore, its Special Weapons Command at Kirtland Air Force Base, Albuquerque, N. Mex., and rechristened the latter as the Air Force Special Weapons Center. The Special Weapons Center will continue to operate at Kirtland field. In the new setup the work of the Special Weapons Center will be co-ordinated with that at seven other centers.

Fertile Field for Machines . . .

Machinery manufacturers looking for business opportunities can almost always unearth new leads from current studies of the Department of Agriculture.

This unit of the government long has been convinced that the future prosperity of the farmer is inexorably tied in with maximum mechanization of his operations to cut labor costs. Working with the Michigan Agricultural Experiment Station, the Agricultural Research Administration has just come up with interesting findings on cheapest means of mechanizing receiving, storing and packing operations at several thousand apple plants in the country. Lowest handling costs—they varied from $9.58 to $1.93—were obtained by using pallets and large fork-type lift trucks handling 48 boxes per load.

One More Chance Under SDPA...

Friction between Reconstruction Finance Corp. and the Small Defense Plants Administration over processing of small-business loans (STEEL, Jan. 28, p. 42) will be eliminated by a newly created procedure. The RFC will henceforth forward all applications to SDPA for small-business loans which RFC decides it cannot authorize under its own statutory authority.

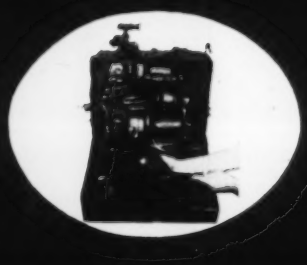
Previously many companies turned down by RFC under Section 4(a) of the Reconstruction Finance Act and Section 302 of the Defense Production Act did not receive consideration from SDPA under Section 714 of the Defense Production Act as amended (Prospective borrowers had to ask for consideration under Section 714 specifically).

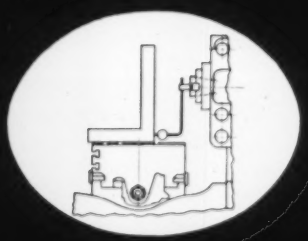
Engines on Army Standard . . .

Military specifications on standardized industrial gasoline engines will be available for use in procurement by approximately July 1.

The engine standardization program, carried on under the Munitions Board Standards Agency, will encompass redesign of automotive, industrial and military-type internal combustion engines. Industry and military working groups have completed the first segment of the project replacing 1187 different commercial parts with 59 standardized parts.

from your Cincinnati HYDRO-MATIC milling machines





CINCINNATI

While waiting for your new CINCINNATI Hydromatic Milling Machine, production must continue with the old machines. Here are a few precautions which you can take with new or old Hydromatics to keep them running efficiently.

HYDRAULIC SYSTEM

Oil is the very life of a hydraulic machine. Use a good quality hydraulic oil. To avoid a major overhaul job, which usually results when the hydraulic unit is neglected like the one shown in the illustration, clean the filter once a month. It's simple and easy to do. Remove filtering element and scrape out sludge once a year.

LUBRICATION

Lubrication of your CINCINNATI Hydromatic is principally automatic, but even so, it cannot be neglected. Follow the recommendations in the instruction book. As a reminder, make a lubrication chart and attach it to your machine.

LEVELING

Keep the machine level. This is especially important with long bed duplex style machines. To facilitate this operation, leveling jacks are built-in on current model machines; leveling blocks can be obtained for older models.

CLEANLINESS

Keep the machine clean. This is important for three critical areas: 1) table ways on bed, particularly older machines without way covers; 2) spindle carrier ways on headstock; 3) area around the table control plunger.

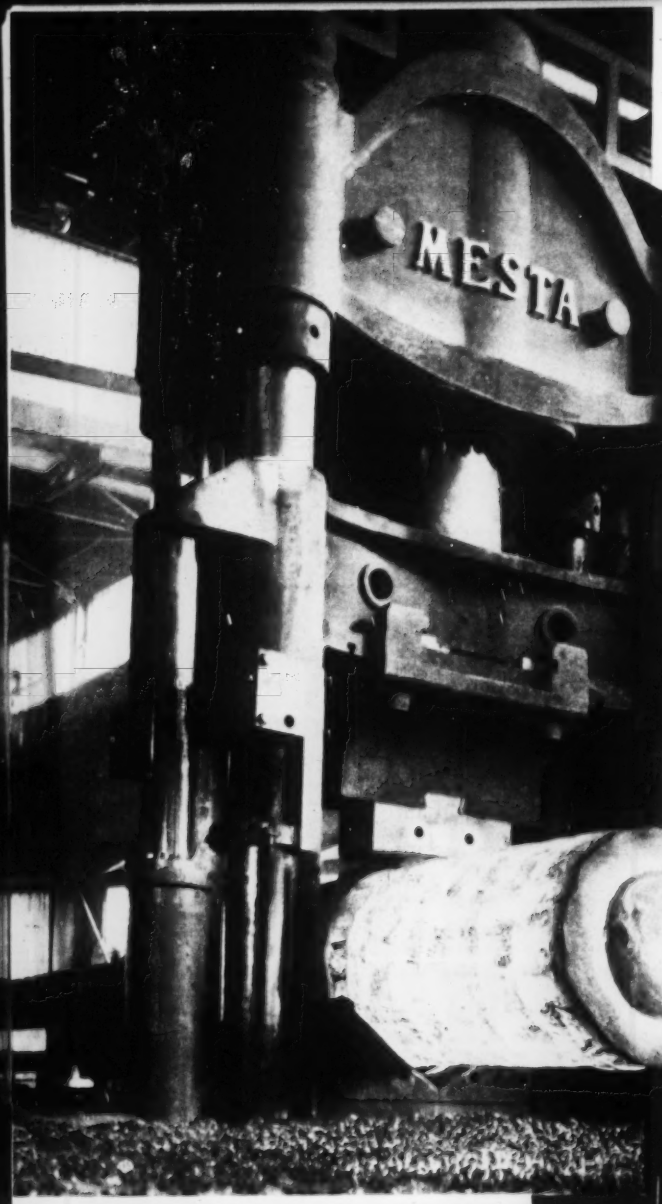
These easy-to-take ounces of prevention will pay well in years of trouble-free, accurate performance by your CINCINNATI Hydromatic.

THE CINCINNATI MILLING MACHINE CO.
CINCINNATI 9, OHIO

P. S. If you're not acquainted with CINCINNATI Hydromatic Milling Machines, write for catalog No. M-1670 for Plain and Duplex Hydromatics; catalog No. M-1602 for Plain and Duplex Tracer Controlled Hydromatics.

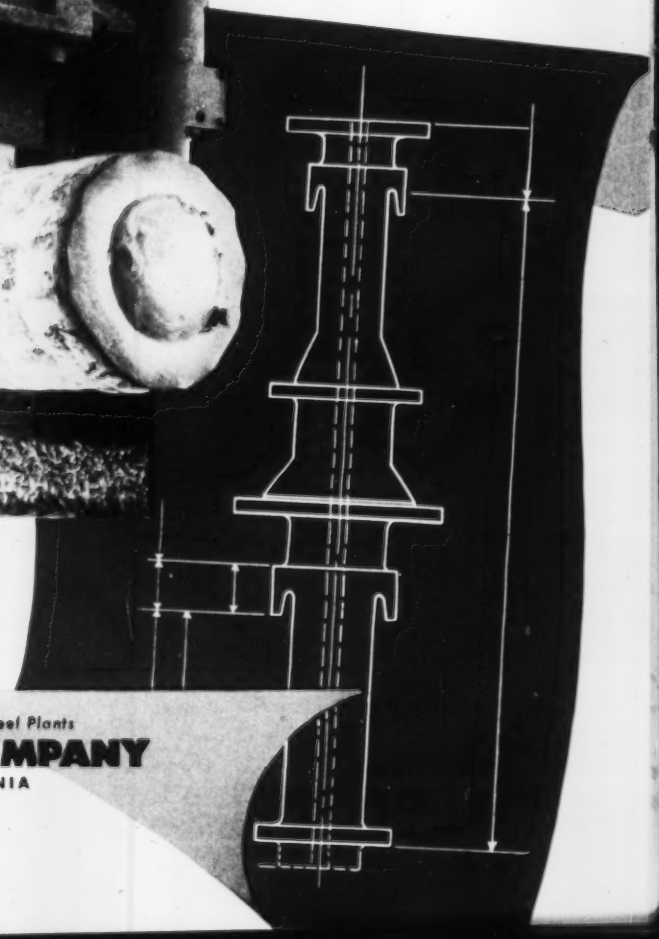
CINCINNATI

MILLING MACHINES • CUTTER SHARPENING MACHINES
BROACHING MACHINES • FLAME HARDENING MACHINES
OPTICAL PROJECTION PROFILE GRINDERS • CUTTING FLUID



FORGE DEPARTMENTS at MESTA

Open Hearth and Electric Furnace Carbon and Alloy Steel Forgings are produced complete in the Mesta plant. Illustrated is a Mesta 6,000 Ton Hydraulic Press forging a 100 inch ingot in one of the Mesta Forge Departments.



Designers and Builders of Complete Steel Plants

MESTA MACHINE COMPANY

PITTSBURGH, PENNSYLVANIA

Construction Down; Controls Complaints Up

Contractors, steel fabricators foresee a business decline this year unless federal controls are relaxed. The availability of construction materials improves

AGREED: That the tempo of construction is declining, alarmingly in some cases.

Members of Associated General Contractors of America Inc., meeting in Detroit last week, concur in that appraisal. So do members of the Central Fabricators Association, an organization composed of structural steel fabricators in the Midwest, meeting last month in Chicago. So does the Department of Labor which estimates that about 400,000 fewer site jobs, on the average, will be available on new construction projects this year than last.

Pessimistic — AGCA says, "The nation's construction industry now is operating substantially below capacity and expects that situation to accentuate during the first half of 1952." The association says the situation is caused entirely by government controls on building. Federal restrictions persist despite the fact that "construction materials other than steel, copper and aluminum are abundant. Even steel is reported plentiful in some areas." The worst cutbacks are on highway jobs; the second most serious on heavy construction.

Compared with a year ago, AGCA finds contractors "substantially less busy, labor and materials (with the exception of steel, copper and aluminum) more abundant. Equipment supply is slightly improved, but tightening."

Into 1953 — Most members of Central Fabricators Association anticipate unemployment and idle plants beginning in the second quarter and extending for the rest of the year and even into 1953 unless changes are made in materials control. The members recommend that long-range planning for commercial, industrial and highway construction be started at once and that self-authorization plans be liberalized.

The Labor Department agrees that construction is declining, but believes that new construction will still require an average of about 2 million full-time workers a month.

The Pendulum Swings—Private new construction as a whole will probably provide an average of 1,375,000 to 1.4 million jobs this year—the smallest number since 1946. Labor needs on public construction, at about 650,000 workers, will be the highest since 1943.

Because it now appears certain that 1952 construction won't even come close to the 1951 record of $39 billion and because more materials are available, NPA relaxed its restrictions on construction of churches, fire stations, orphanages and similar types of buildings. NPA has given the green light to 645 religious, community and municipal projects estimated to cost more than $218 million. Those projects had been deferred. Builders can go ahead with preliminaries now but they won't get actual rations of controlled materials until the third quarter. NPA will also allow most stalled commercial projects at least one per cent started to go ahead.

AEC Authorizes Atom Reactor

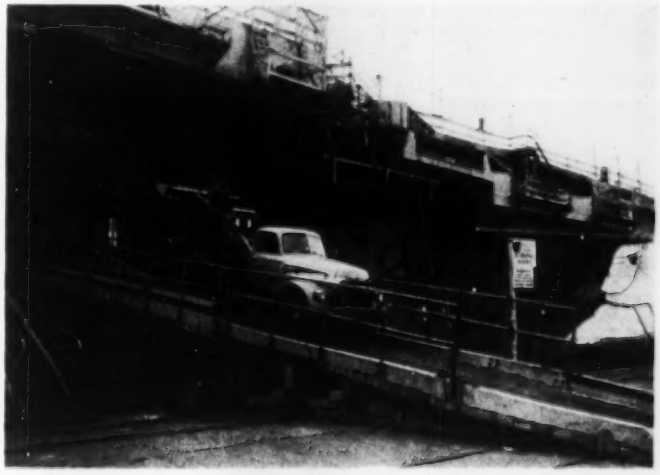
Immediate construction of General Electric Co.'s land based prototype of an atomic power plant for submarines has been authorized by the U. S. Atomic Energy Commission. The reactor will be located on the 4000-acre site owned by AEC in West Milton, N. Y.

This prototype will be used for final development work leading to construction of an intermediate atomic energy reactor for submarine propulsion.

Shipbuilding Shows Second Gain

Shipbuilding in the United States showed an increase last month, marking the second consecutive month of improvement. Over 1.8 million deadweight tons are being built or have been contracted for. This represents a postwar high.

Among the newest ships to be launched is the *SS Keystone Mariner*, one of 35 fast, heavy dry cargo ships being built by the Sun Shipbuilding & Dry Dock Co., Chester, Pa. It will have capacity for 12,900 deadweight tons.



"CAN DO" SHIPYARD: Loading the aircraft carrier *USS Hornet* by the ramp method instead of with cranes saves valuable time at the New York Naval Shipyard. Ideas such as this have overcome many shipbuilding, overhauling and repair problems to give the Brooklyn yard the "can do" nickname. Since 1820, the yard built or serviced over 10,000 naval vessels. Comprising 290 acres, 19 miles of highway, 30 miles of railroad track and over 18,500 employees, it is now the lead yard for modernizing and recommissioning aircraft carriers

Reduce the use of critical alloys in gas turbine structures

N-A-X AC9115 ALLOY STEEL offers a means of reducing the use of critical alloy steels of the "stainless" type in gas turbine and similar applications. In specific cases it has replaced over half the amount of strategic material originally required, with no sacrifice of quality.

N-A-X AC9115 ALLOY STEEL has high strength and toughness values at temperatures ranging from —70 F. to +1,000 F. It can be readily cold formed into the most difficult shapes; its response to welding by any process is excellent. It must, however, be suitably coated for protection against cold or hot corrosion.

N-A-X AC9115 ALLOY STEEL is available in bars as well as flat rolled products. Investigate the outstanding properties and characteristics of this steel and, through its use, conserve the critical material so necessary to our nation.

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NATIONAL STEEL CORPORATION

By H. C. TUTTLE *Detroit Editor*

Mirrors of Motordom

The unemployment situation in Detroit is developing into a political football, with the auto industry anxiously trying to steer a neutral course

DETROIT

POLITICAL HAY is being made by the Democrats, the United Autoworkers and especially by Senator Blair Moody and Walter R. Reuther in a rhubarb with Senator Robert A. Taft, the local chamber of commerce and the National Association of Manufacturers.

Doing its best to stay out of the fracas is the automobile industry because it realizes that it would be handling dynamite. Any statement it makes would be like the yes or no answer to the question: "Have you stopped beating your wife yet?"

New Directions—What started out innocently enough as a Senate Finance Committee hearing into the Moody-Dingell Bill, S-2504 and HR 6174, which would supplement state unemployment compensation benefits with federal money, quickly turned into a free-for-all, no-holds-barred fight in which the need for more automaking materials was opened to serious question, and the level of Detroit's unemployment was minimized.

In the initial stages, Senator Taft argued that state unemployment commissions should and, in the case of Michigan, could bear the load imposed by conversion unemployment. In support of this contention is the fact that in spite of rising unemployment in Michigan the reserve fund of the Michigan Employment Security Commission has grown in a year and a half from $338 million to $353.6 million. Other arguments against the bill were that it would put the federal government into the state's authority area, and that it would encourage idleness by raising unemployment compensation by a substantial amount.

Calm, at First—Up to this point the hearings were dispassionate. The fireworks began when Willis H. Hall, secretary of the Detroit Board of Commerce, Frank E. Cooper, counsel for the Michigan Manufacturers Association, and Allan D. Marshall, vice chairman of the NAM's Employee Benefits Committee, testified that Detroit's and Michigan's unemployment is not abnormally high. They questioned the existence of any emergency which would warrant federal help in the form of higher unemployment compensation.

It was Mr. Hall's remarks which brought down the most wrath. It is his stand that unemployment in the auto industry is only slightly above normal. The figure for Detroit's unemployed as compiled by the Michigan Employment Security Commission and encompassing the metropolitan area of Wayne, Oakland, and Macomb counties was 107,000 in January, and is estimated at 105,000 for February. Unemployment, says the Board of Commerce, has averaged 80,000 over the past three years. A "normal pre-Korean peacetime period," says Mr. Hall, was January, 1950, when the area had 88,000 unemployed, and 1,274,000 people at work in all types of employment except farm. The January, 1952, employed total is set at 1,325,000.

Confirmation — Senator Moody and Mr. Reuther sought comment from members of the auto industry on Mr. Hall's position. Reuther asked them "to promptly and publicly repudiate Hall's astounding testimony. If Mr. Hall's position is not challenged at once he will have succeeded in torpedoing in one day the work which industry, labor and local and state government officials have jointly been carrying forward for many months."

Only acknowledgements to this request were by Chrysler Corp. and Ford Motor Co. Both said they believe Detroit's unemployment is a serious problem. Ford's Ernest R. Breech wired Reuther tnat 7000 Ford seniority workers in Michigan are unemployed at present and that total Ford payrolls in Michigan have been reduced by 24,000 since September, 1950.

Chrysler said that its work force was 25 per cent under a year ago, the company having about 20,000 fewer employees now than at that time.

If Mr. Hall's testimony is taken as indicative that there is little cause for alarm over the industry's

ROUGH ROAD AHEAD: A test driver puts a new Chrysler convertible through its paces at the Chrysler Corp. proving ground near Chelsea, Mich. The figure-8 dirt surface road is designed as a wheel strength test for the speeding car

unemployment, the government may not see fit to permit any higher production than currently and will carry through with its plan to limit output further in second quarter. The Board of Commerce, however, is anxious that this doesn't happen, and believes that Mr. Hall's remarks were misinterpreted. To set the record straight it will send out copies of his testimony as soon as they can be prepared.

A Matter of Emphasis—Most of the damage was done by the emphasis which was placed on the normality of the present situation. Guy Nunn, UAW-CIO radio and television commentator, said the workers now feel they have been "used" by the NAM and the Chamber of Commerce. Senator Moody, interviewed by Mr. Nunn, said the testimony "reveals a Republican attitude," and Walter Reuther on the same program said "Hall believes unemployment will make it possible to get cheap labor."

That is the political football which Breech told Reuther he hoped the unemployment situation would not become. As far as the automakers are concerned the unemployment situation can be corrected by allocation of more copper to them. Mr. Breech said, "All the evidence we have indicates that the copper shortage is more statistical than real. Our suppliers tell us that sufficient copper is available to permit the automobile industry to raise its schedule without any detriment to the defense effort."

The Detroit Board of Commerce in its weekly magazine, *The Detroiter* says, "The automobile industry estimates that about 4700 tons of copper are needed today for construction of 200,000 more cars. This additional output of cars would furnish employment to perhaps 75,000 more workers, many in the Detroit area."

The Straight and Narrow—To keep from playing up or playing down the seriousness of the situation has caused the industry to walk a chalk line. At one point, when the UAW was overemphasizing the magnitude of unemployment in Flint, General Motors felt compelled to set the record straight on the number laid off by it, and several GM divisions announced they have reduced their payrolls merely by failing to replace "quits." The charge that the industry is trying to be on both sides of the fence at once appears unfounded.

There was some indication last week that the problem of unemployment might become academic. Hints came out of Washington that the second quarter passenger car production quota might be raised to one million, and the arguments in favor of allowing car makers to buy foreign copper at the world price were sounded. More defense work has been put into the area, principally in the form of increased contracts for military trucks, items already in quantity production.

Auto, Truck Output

U. S. and Canada

	1952	1951
January	418,486*	645,688
February	454,000*	658,918
March		802,737
April		680,281
May		695,898
June		653,682
July		522,858
August		571,442
September		505,758
October		558,971
November		480,199
December		404,547
Total		7,180,979
Week Ended	**1952**	**1951**
Feb. 2	102,402	150,984
Feb. 9	102,406	116,071
Feb. 16	111,821	178,141
Feb. 23	109,439	199,478
Mar. 1	110,000*	177,356

Sources: Automotive Manufacturers Association, Ward's Automotive Reports. *Preliminary.

K-F Modifies Henry J Slightly

The second group of 1952 models to be brought out by Kaiser-Frazer appeared last week as the Henry J "Corsair" was introduced. This swashbuckling title applies to the mildly rakish appearance which the car acquires by virtue of new grille treatment and fin-mounted tail lights. The Henry J. Vagabond and Kaiser Virginian, sporting the spare tire on the rear deck, were introduced as the year began.

Mechanical changes include new front and rear shock absorbers to dampen rebound, changed tie rods and clutch linkage for greater ease of handling and shifting. "Follow-through" ignition and starter motor permits continuous engagement until the motor comes to life. A new 4.27 to 1 axle is standard.

Olds Tries Headlight Dimmer

A new piece of optional equipment has become available on Oldsmobiles—the "Autronic Eye" for automatic headlight dimming. Oldsmobile often is the General Motors Division which gives a new device the first whirl. This gadget is billed as an important contributor to safety "because it eliminates the nerve tension involved in frequent manual operation of dimmers."

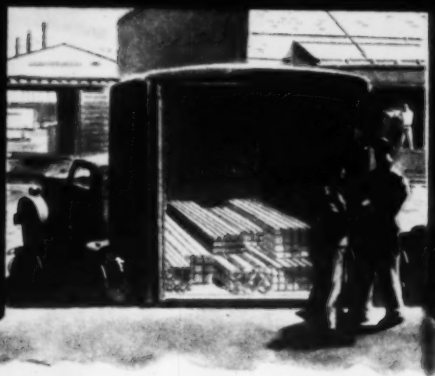
Taking its name from the words "automatic" and "electronic," the eye is contained in a small housing and mounts on the dashboard to peer through the windshield. Light picked up from approaching cars activates the photoelectric cell to depress the headlight beam. The brights are restored automatically.

Ford Offers Three New Engines

Three new heavy-duty industrial engines, all equipped with overhead valves, have gone into production at Ford Motor Co. They double the number of specially designed engines which the company makes for industrial application.

Identified by their cubic inch displacement, the new power plants are the 317, a V-8 with 3.8-inch bore and 3.5-inch stroke, which develops 140 bhp at 2800 rpm; the 279, also a V-8 with a 3.56-inch bore and 3.5-inch stroke developing 125 bhp at 2800 rpm; and the 215, a six rated at 93 bhp and having 3.56-inch bore and 3.6-inch stroke. The short-stroke design reduces piston travel and claims improved fuel economy. All engines have replaceable thin shell precision copper-leaded bearings. The cylinders are surrounded by full-length water jackets. Belief is that nodular iron is used for the block. Ford's announcement is that "special high-grade iron" is used. Discussion by Ford of its shell molding process and of its use of nodular iron are taboo, supported by a government directive concerning its secret nature.

for better die production...



"DESEGATIZED" hi carbon-hi chromium DIE STEELS

provide a selection range designed to fit your individual need for die steels:

- Select B—a general purpose air hardening punch and die steel
- Olympic—a very popular non-deforming steel, ideal for intricate cold work applications requiring maximum performance
- Cobalt Chrome—a high carbon—high chromium steel plus cobalt for superior cutting ability
- GSN—an oil hardening die steel for long production runs, subject to severe wear
- BR-4—a high carbon—high chromium die steel with additional alloy content for maximum abrasion resistance.

Production economy demands the best die performance! Select the best steel for the job—one of the "DESEGATIZED" Hi Carbon—Hi Chromium Die Steels!

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LATROBE ELECTRIC STEEL CO., LATROBE, PA.

Yes! Please send me the booklet, "Selection and Use of Latrobe's "DESEGATIZED" Hi Carbon—High Chromium Die Steels".

NAME .....

POSITION .....

COMPANY .....

STREET .....

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81

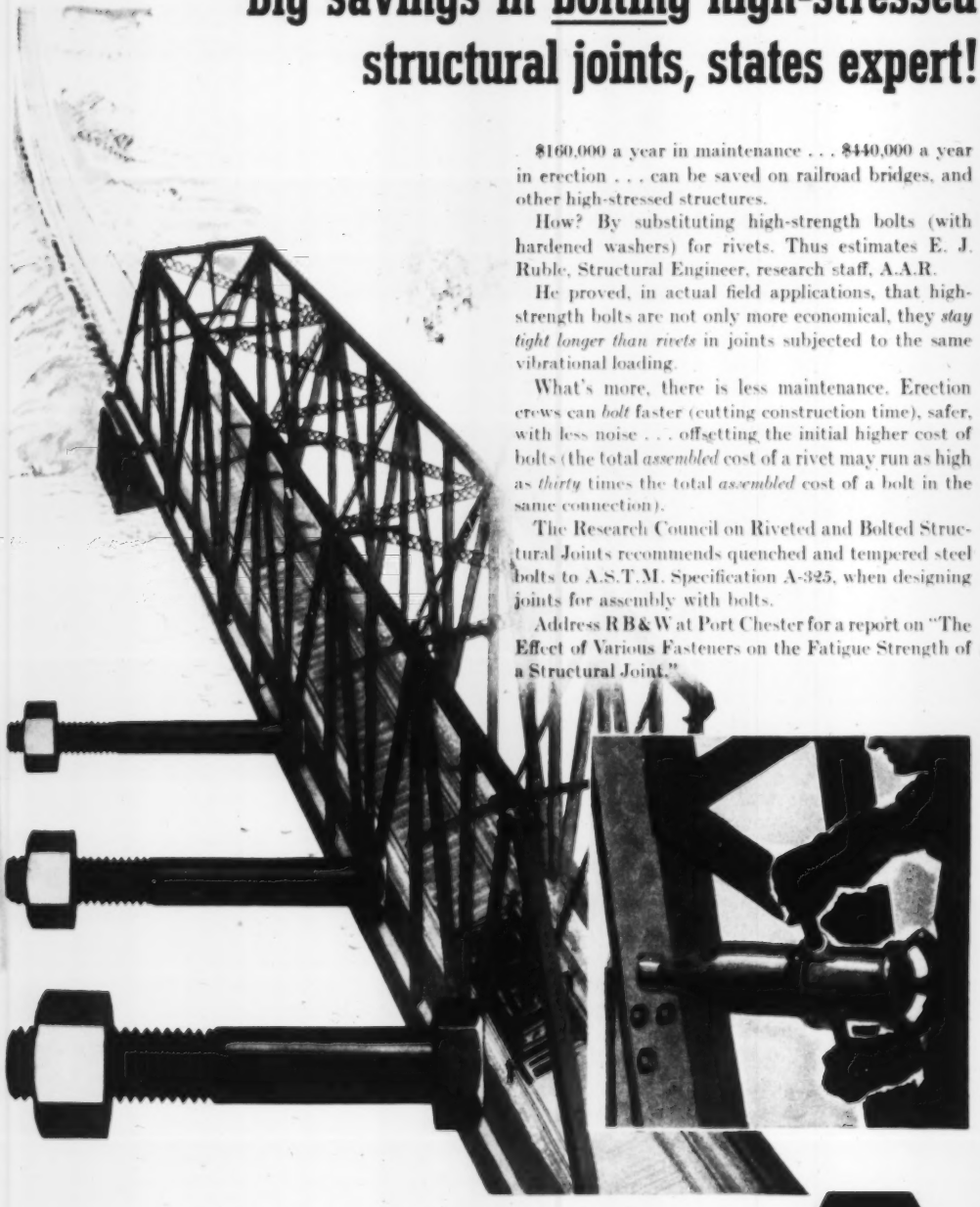
LATROBE ELECTRIC STEEL COMPANY

LATROBE, PA.

Branch Offices and Warehouses: BOSTON, BUFFALO, CHICAGO, CLEVELAND, DAYTON, DETROIT, HARTFORD, LOS ANGELES, MILWAUKEE, NEW YORK, PHILADELPHIA, PITTSBURGH, ST. LOUIS, TOLEDO.

Sales Agents: DALLAS, DENVER, HOUSTON, MINNEAPOLIS, SEATTLE, WICHITA.

Big savings in bolting high-stressed structural joints, states expert!



$160,000 a year in maintenance . . . $440,000 a year in erection . . . can be saved on railroad bridges, and other high-stressed structures.

How? By substituting high-strength bolts (with hardened washers) for rivets. Thus estimates E. J. Ruble, Structural Engineer, research staff, A.A.R.

He proved, in actual field applications, that high-strength bolts are not only more economical, they *stay tight longer than rivets* in joints subjected to the same vibrational loading.

What's more, there is less maintenance. Erection crews can *bolt* faster (cutting construction time), safer, with less noise . . . offsetting the initial higher cost of bolts (the total *assembled* cost of a rivet may run as high as *thirty* times the total *assembled* cost of a bolt in the same connection).

The Research Council on Riveted and Bolted Structural Joints recommends quenched and tempered steel bolts to A.S.T.M. Specification A-325, when designing joints for assembly with bolts.

Address R B & W at Port Chester for a report on "The Effect of Various Fasteners on the Fatigue Strength of a Structural Joint."

RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY

RB&W
THE COMPLETE QUALITY LINE

Plants at: Port Chester, N. Y., Coraopolis, Pa., Rock Falls, Ill., Los Angeles, Calif. Additional sales offices at: Philadelphia, Detroit, Chicago, Dallas, Oakland. Sales agents at: Portland, Seattle.

107 YEARS MAKING STRONG THE THINGS THAT MAKE AMERICA STRONG

The Business Trend

Hum of defense industry contrasts with quiet on civilian front. If consumers start buying again the business complexion could improve substantially

MACHINERY of defense industry is humming louder than might be expected from the publicity given to stretching of the defense program.

Weak spots, of course, are bound to develop in a controlled economy as well as in normal times. A lot of the defense-producing industry is jammed with work, but that doesn't mean everyone is.

No Explanation—On the civilian industry front, all's quiet—too quiet to suit most producers. While that segment of the economy absorbs the good news from Washington on materials allowances and pricing standards, it is pondering one thing not explained by existing regulations: How to sell what is made.

The dollar-clutching consumer is still the enigma of the day. With more people working than ever before and earning more than ever before, you might expect faster and higher spending than ever before. It's just not so. Even at lowered output levels, retailers are having trouble peddling some of industry's products.

The Pinches—A partial explanation may be seen in the tax pinch. That might indicate a sales acceleration in March, after income accounts are settled.

A deeper cause may be that money in consumers' hands has diminishing real value. As the chart on p. 66 shows, purchasing power of the dollar, as measured by consumers' prices, has dropped steadily for the past year. That's despite a slight upswing in wholesale purchasing power. The money in people's pockets may start an itch as prices edge downward—and they will for many products. Maybe then the waiting for bargain sales will end.

Production Higher—Basic industrial production, measured by STEEL's weighted index, edged up one point in the week ended Feb. 23 to 214 per cent of the 1936-1939 average. February as a whole showed slightly higher real production than did January.

Disappointing Record . . .

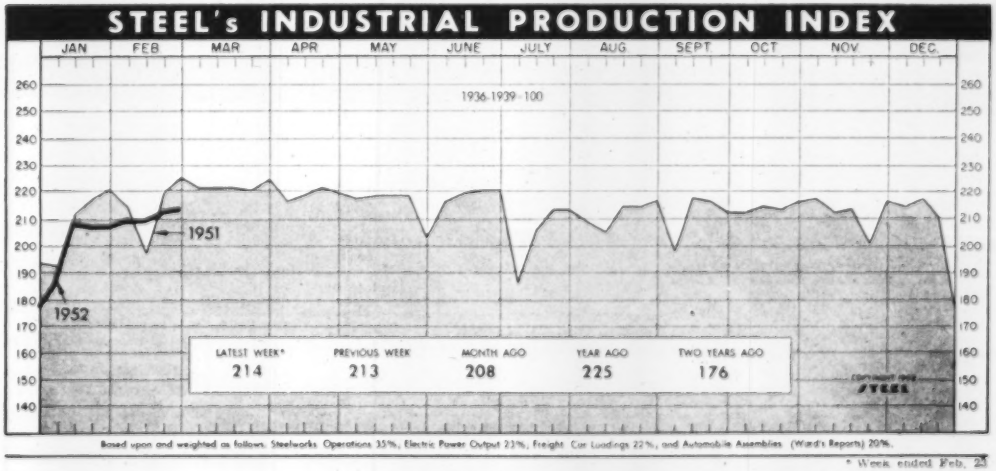
Revenue freight carloadings, prime indicator of trade velocity, have been disappointing so far this year. To date average activity has been about 12 per cent below last fall. Comparisons with 1951 and 1950 are favorable, but that's because strikes tied up rail traffic in the early parts of those years.

No Tapering Seen . . .

Slackening demand for some steel products doesn't signal any tapering of ingot production for some time, if at all. Order books are still comfortably filled through the second quarter for most producers. At the mills, production has been at capacity for three weeks and nosed above that mark in the week ended Mar. 1. American Iron & Steel Institute calculates production at 2,096,000 tons in that week. In the comparable week a year ago, 1,995,000 net tons were poured.

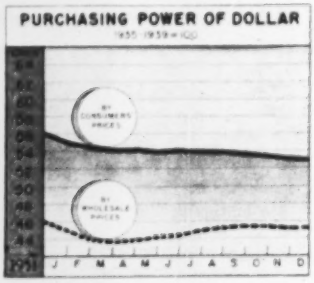
The Worst Is Over . . .

The auto industry may have reached the lowest point in its operations under government restrictions. That prediction, from *Ward's Automotive Reports*, sees increased second quarter quotas a possibility because of an easing in supply of steel, lead, zinc, secondary aluminum and, to some extent, copper. Much optimism in Detroit stems from indications that the auto industry won't be the "whipping boy



Based upon and weighted as follows: Steelworks Operations 35%, Electric Power Output 23%, Freight Car Loadings 22%, and Automobile Assemblies (Ward's Reports) 20%.

* Week ended Feb. 23

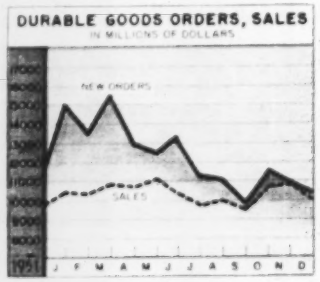


Purchasing Power of the Dollar

Cents, as measured by

	Wholesale Prices		Consumers' Prices	
	1951	1950	1951	1950
Jan.	44.6	53.1	55.1	59.5
Feb.	43.8	52.7	54.4	59.6
Mar.	43.7	52.7	54.2	59.4
Apr.	43.8	52.6	54.2	59.3
May	44.0	51.6	53.9	58.1
June	44.4	51.2	54.0	58.8
July	44.0	49.4	53.9	58.1
Aug.	43.2	48.3	53.9	57.7
Sept.	43.3	47.5	53.6	57.3
Oct.	45.1	47.5	53.4	56.9
Nov.	45.1	46.8	53.0	56.7
Dec.	45.2	45.8	52.9	55.9

U. S. Office of Business Economics

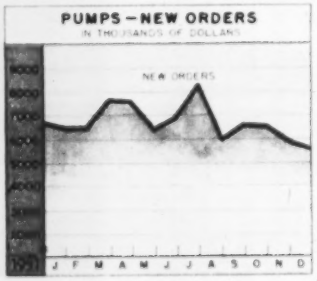


Durable Goods Orders, Sales

In Millions of Dollars

	New Orders		Sales*	
	1951	1950	1951	1950
Jan.	15,050	7,570	10,430	6,092
Feb.	13,474	7,224	10,296	7,312
Mar.	15,342	8,611	10,851	7,629
Apr.	12,987	7,893	10,739	7,813
May	12,404	8,093	11,150	8,808
June	13,303	10,368	10,353	9,016
July	11,274	11,032	9,741	8,938
Aug.	11,046	14,305	10,052	9,902
Sept.	9,880	12,961	9,509	9,318
Oct.	11,584	12,220	10,700	9,748
Nov.	11,090	10,562	10,753	9,852
Dec.	10,322	11,703	9,997	9,869

*Seasonally adjusted. U. S. Office of Business Economics

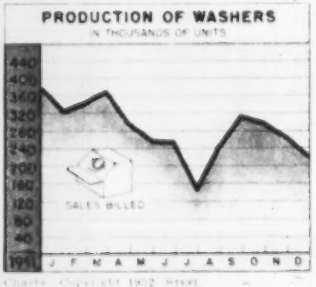


Pumps, New Orders

In Thousands of Dollars

	1951	1950	1949
Jan.	6,427	2,586	3,390
Feb.	6,480	2,938	3,247
Mar.	7,664	3,103	3,093
Apr.	7,593	3,526	2,999
May	6,371	3,668	2,775
June	6,852	4,153	3,019
July	8,358	4,080	3,358
Aug.	5,911	6,429	3,767
Sept.	6,552	5,191	2,914
Oct.	6,566	4,985	2,539
Nov.	5,008	5,961	2,929
Dec.	5,553	6,720	2,660
Total	80,175	53,400	36,386

Hydraulic Institute



Household Washers

Sales Billed, Units

	1952	1951	1950
Jan.	233,908	321,062	275,576
Feb.		341,328	342,967
Mar.		360,455	423,862
Apr.		292,191	353,072
May		243,942	304,640
June		203,119	329,217
July		139,279	282,261
Aug.		239,081	381,452
Sept.		313,246	424,043
Oct.		297,858	439,924
Nov.		262,484	379,964
Dec.		218,661	377,013
Totals		3,391,123	4,289,931

American Home Laundry Mfrs. Assoc.

Charts Copyright 1952 Steel

Issue Dates of other FACTS and FIGURES Published by STEEL

Construction	Feb 11	Gray Iron Castings	Dec 31	Ranges, Gas	Feb 25
Employ. Metalwkg.	Jan 28	Heaters	Jan 21	Refrigerators	Feb 25
Employ. Steel	Jan 28	Indus. Production	Feb 18	Steel Castings	Dec 31
Fab. Struc. Steel	Feb 4	Malleable Castings	Dec 31	Steel Forgings	Feb 25
Foundry Equip.	Feb 18	Machine Tools	Feb 11	Steel Shipments	Dec 17
Freight Cars	Jan 28	Prices	Feb 18	Vacuum Cleaners	Feb 4
Furnaces, Indus.	Feb 18	Radio, TV	Jan 21	Wages, Metalwkg.	Jan 28
Gear Sales	Feb 11	Ranges, Elec.	Feb 25	Water Heaters	Feb 11

of defense" as some people feared.

For the first time this year, U. S. auto plants reached a weekly volume equal to 4 million passenger cars annually, says *Ward's*. That was in the weeks ended Feb. 16 and 23. In the latter period, U. S.-Canadian production amounted to 109,439 cars and trucks. The previous week's turnout was 111,821.

New passenger car registrations in 1951, according to R. L. Polk & Co., amounted to 5,060,903. In 1950 the total was 6,326,438.

Plateau Reached . . .

After a spectacular spurt from July to yearend, machine tool builders leveled out their production in January. The National Machine Tool Builders' Association index of January shipments was pegged at 266.3 per cent of the 1945-1947 average. In December it was 264.7. Index of new orders rose slightly—from 376.5 in December to 381.0 in January. Ratio of unfilled orders to demonstrated production rate sank from 19.4 to 1, to 18.1 to 1.

Considerable Gap . . .

Gap between order position and production schedules is considerable, says National Association of Purchasing Agents after its February survey of members. Only 19 per cent of buyers canvassed reported high defense production in their companies. The others range from none to less than 10 per cent defense business. Buyers say prices are static, but more soft spots are developing. Inventories are lower and better adjusted; buying policy is cautious with 93 per cent of members reporting their purchases confined within the 90-day bracket. Many buyers expressed doubt that civilian business would pick up substantially in many lines if controls were released.

Time On The Job . . .

Tabulations of hours worked by employees in various industries show clearly the ones that are booming, the ones depressed—and to a degree, the extent. In the Labor Department's latest estimate of the industrial workweek (for mid-February) the average for all

workers was 40.7 hours, three-tenths of an hour less than in January, 1951.

Over-the-year decreases of half an hour or more were reported in leather, chemicals, textiles, apparel, paper, lumber and stone, clay and glass industry groups. Except for chemicals, those industries dropped from 5 to 10 per cent in employment, too.

In contrast, average workweek of defense and defense-support industries was at or above the high levels of last year. Ordnance, machinery and primary metals industries reported average workweeks of over 42 hours in mid-January, indicating extensive overtime for many of their workers.

Sluggish Pattern . . .

Home laundry equipment sales at factory level followed the sluggish retail pattern in January. American Home Laundry Manufacturers Association says standard size household washer sales aggregated 213,998 units in January, a drop of 33 per cent from the year-ago mark and off 2.1 per cent from December. Dryers are still in great demand; January sales of 45,121 units were off 3.5 per cent from December, but gained 41 per cent over January, 1951. Ironer sales slumped 7.5 per cent from December and 36 per cent from the year-ago mark to 15,636 in January.

Trends Fore and Aft . . .

More businesses went broke in January (671) than in any of the past five months. . .Not only the builders are cheering the relaxed construction curbs; it means more business for the hundreds of industries whose products go into the new homes, office buildings and other commercial projects. . . Redemptions topped sales of U. S. savings bonds by more than a billion dollars last year and maturities don't reach their peak till 1954. . .Battery makers are cutting prices again. . .Bureau of Labor Statistics' new wholesale price index bowed in last Friday. . .Business loans are well ahead of year-ago levels. . .Production workers in manufacturing industries numbered 12,750,000 in January. . . . Utilities produced 12.5 per cent more electricity in 1951 than the year before. . . . Retail stores total sales in 1951 amounted to $151 billion, 5 per cent higher than 1950's $144 bililon. But when the price rise over the year is accounted for, physical volume was about 4 per cent below 1950. Fourth quarter sales reversed the down-trend started in the second quarter though.

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	100.0	100.0	95.5
Electric Power Distributed (million kwhr)	7,461	7,440	6,905
Bituminous Coal Output (daily av.--1000 tons)	1,750	1,764	1,781
Petroleum Production (daily av.—1000 bbl)	6,350[1]	6,363	5,945
Construction Volume (ENR—millions)	$222.1	$233.5	$223.8
Automobile, Truck Output (Ward's—units)	109,439	111,821	199,478
TRADE			
Freight Car Loadings (unit—1000 cars)	745[1]	738	735
Business Failures (Dun & Bradstreet, number)	177[1]	125	127
Currency in Circulation (millions)[3]	$28,387	$28,425	$27,164
Dept. Store Sales (changes from year ago)[3]	−6%	−8%	+24%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$18,469	$13,056	$18,057
Federal Gross Debt (billions)	$260.1	$260.1	$255.9
Bond Volume, NYSE (millions)	$11.6	$10.5	$18.5
Stocks Sales, NYSE (thousands of shares)	6,634	5,370	7,817
Loans and Investments (billions)[4]	$73.7	$73.8	$69.2
United States Gov't. Obligations Held (billions)[4]	$32.2	$32.4	$30.9
PRICES			
STEEL's Weighted Finished Steel Price Index[5]	171.92[1]	171.92[1]	171.92
STEEL's Nonferrous Metal Price Index[6]	243.6	243.6	262.3
All Commodities[7]	174.8	175.4	183.8
Metals and Metal Products[7]	193.4	193.4	188.1

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1951, 1,999,035; 1952, 2,077,040. [3]Federal Reserve Board. [4]Member banks, Federal reserve system. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1926=100.

Even the smallest size Reamers are Standard with L&I

The Reamer Specialists

LAVALLEE & IDE, INC.

CHICOPEE, MASS.

Another "orchid" for Levinson workmanship!

The United Conveyor Corporation are suppliers of ash, fly ash and dust handling equipment. In their installation considerable fabricated structural steel must be supplied, and it has been the privilege of Levinson Steel to work with the makers of NUVEYOR Systems in meeting this need. How well we have tried to serve them is told in their very timely letter reproduced herewith.

It illustrates once again that accurate fabrication not only saves time on the job but cuts erecting costs in the field!

United Conveyor Corporation

"NUVEYOR"
PNEUMATIC AND HYDRAULIC CONVEYOR SYSTEMS
ASH STORAGE TANKS, ASH PIT HOPPERS

Chicago 3, Ill.

December 6, 1951

The Levinson Steel Company
So. 20th & Wharton Streets
Pittsburgh 3, Pennsylvania

Gentlemen:

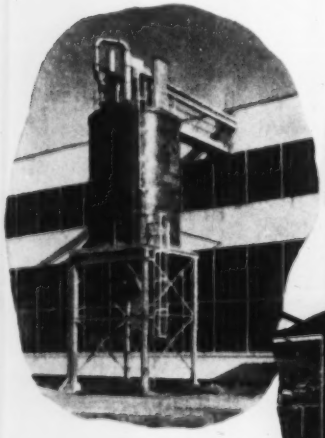
We have just received your telegram informing us of shipment of our order #51197 and we wish to thank you very much for your splendid cooperation in working out a substitute section for us on this rush

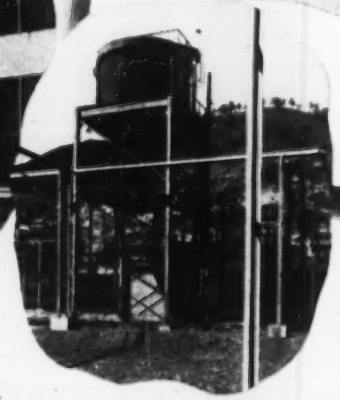
For many years, your company has been the main source of supply for our requirements of fabricated structural steel and we take this opportunity to tell you that we greatly appreciate the way you have met our shipping schedules and your excellent workmanship which has reduced the cost of field erection for us on hundreds of installations.

tionship.

Yours very truly,
UNITED CONVEYOR CORPORATION

BY E. L. Becker
E. L. Becker
Purchasing Agent





These photographs show (at left) a NUVEYOR Pneumatic System that handles boiler ash from finest dust to heaviest clinkers; and (to right) an ash sluicing system that is hydraulically operated, so that commercially dry ashes are discharged into railroad cars with a minimum of labor, and cost.

50 YEARS
OF SPECIALIZED SERVICE TO INDUSTRY

LS-22

The Levinson STEEL COMPANY

20TH & WHARTON STS., PITTSBURGH 3, PA.

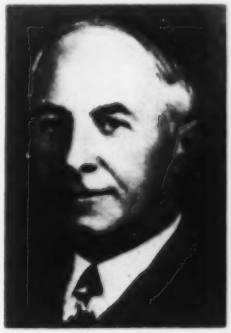
LS-23

Fabricators of Steel for Industry

Men of Industry

PAUL S. GRUBER
. . . asst. chief engineer at Ferro

WILLIAM J. DURING
. . . Precision Castings exec. V. P.



EVERETT E. LUNDBERG
. . . new president of Briggs Mfg.

Paul S. Gruber was appointed assistant chief engineer, engineering division, **Ferro Corp.**, Cleveland. With the corporation since 1930, for the last two years he has been working with General Electric Co. on installation of porcelain enameling furnaces in that company's new appliance manufacturing plant in Louisville.

John M. Sperry was appointed sales manager, heating pump department, **Economy Pump Division**, C. H. Wheeler Mfg. Co., Philadelphia. **Zay B. Curtis Jr.** was appointed assistant to the president of Wheeler. He was recently works manager, Hamilton-Thomas Corp.

Edmond M. Wagner was appointed to the newly created position of director of engineering and manufacturing for the West Coast operations of **Ekco Products Co.** His headquarters are at the Ekco plant in Whittier, Calif.

H. J. Morrison assumes the duties of assistant works manager for the Cleveland operations of **Aluminum Co. of America.** He is succeeded by **R. F. Bell** as head of Alcoa's Cleveland forge plant, and **W. S. Mayes** becomes superintendent there.

Dr. Clifford E. Berry was promoted to assistant director of research at **Consolidated Engineering Corp.**, Pasadena, Calif.

D. A. Perkins was appointed assistant purchasing agent, **Solar Aircraft Co.**, San Diego, Calif.

William J. During, previously vice president-general manager, **Precision Castings Co. Inc.**, Fayetteville, N. Y., was promoted to executive vice president. Advanced to vice presidents are **J. J. Punke**, formerly chief engineer and factories manager; **Albert Lintel**, factory manager in charge of Syracuse, N. Y., and Fayetteville operations; and **Ross W. Castle**, western sales manager.

Paul R. Copeland Jr. was named advertising and sales promotion manager, home appliance division, **Murray Corp. of America**, Scranton, Pa.

Charles D. Haxby and **S. W. Galloway** were elected vice presidents of **Rust Engineering Co.**, Pittsburgh.

W. Frank Kelly becomes assistant vice president, and **John E. Holtman**, general superintendent of foundries, **American Manganese Steel Division**, Chicago, American Brake Shoe Co. **B. S. Weselis**, assistant works manager, succeeds Mr. Holtman as works manager at the Chicago Heights, Ill., plant, and is succeeded by **P. H. Bohlen.**

Kaiser Aluminum & Chemical Sales Inc. appointed **Donald M. Walker** assistant product manager, pig and ingot products, in the Chicago general sales office, and **Walter A. Gibbs** was named assistant sheet product manager. **Frederick C. Jones** becomes branch representative, Minneapolis sales office.

Everett E. Lundberg replaces **W. D. Robinson** as president and general manager, **Briggs Mfg. Co.**, Detroit. Mr. Robinson was named chairman of the board, succeeding the late **Walter O. Briggs. Walter O. Briggs Jr.** was made assistant general manager in addition to his position as executive vice president. Vice President **Fred W. Hofmann** was elected to fill the vacancy on the board of directors.

Jules K. Egerman was appointed district manager of sales, **Columbia Steel & Shafting Co.** and Summerill Tubing Co., a division. His headquarters are in Philadelphia.

Harry H. Wooden was appointed controller, **Hydraulic Equipment Co.**, Cleveland. Formerly with F. C. Russell Co., he succeeds **Roy W. Swisher**, resigned.

Ceco Steel Products Corp., Chicago, elected as directors **J. F. Seifried, C. S. Nichols** and **O. L. Davis.** New vice presidents are **C. Foster Brown Jr.**, new aluminum window division; **J. E. Grogan**, general counsel; **Raymond J. Anen**, manufacturing; and **E. T. Gustafson**, eastern districts. **P. E. Newey** retired as treasurer and controller.

Wallace A. Doepel was appointed assistant sales manager, **Arthur Colton Co.**, division of Snyder Tool & Engineering Co., Detroit.

Thomas E. Lloyd was appointed assistant to the president, **Salem-Brosius Inc.**, Pittsburgh. He previously was manager of publica-

tions, American Institute of Mining & Metallurgical Engineers, and editor of its publication, *Journal of Metals*. From 1940 to 1950 he was on the staff of *Iron Age*.

Decentralization of **General Electric Co.'s** transformer and allied products division at Pittsfield, Mass., resulted in establishment of three independent business operations—the power transformer, distribution transformer, and capacitor departments—and a laboratory-engineering department. Managers of the respective business departments are **W. S. Ginn, R. W. Smith** and **A. W. Hough. Dr. K. B. McEachron** is manager, laboratory-engineering department. The capacitor department is located at Hudson Falls, N. Y.

L. H. Woods, formerly with the machine tool division, Strong, Carlisle & Hammond, has joined the sales organization of **Cleveland Tapping Machine Co.**, Cleveland, a subsidiary of Automatic Steel Products Inc.

Meade F. Moore was elected vice president in charge of research, **Nash Motors Division**, Nash-Kelvinator Corp., Detroit. **N. E. Wahlberg** retired as vice president in charge of Nash engineering.

Hayden Kelly was named advertising manager, **Fresh'nd Aire Co.**, Chicago, a division of Cory Corp. He was formerly with Hotpoint Inc.

Creation of a new products department and appointment of **John P. Emmett** as its head was announced by **Detrex Corp.**, Detroit. He will handle market research and sales development of all new products while they are in the premarketing phases. The company's program of market expansion, under Mr. Emmett, involves acquisition of raw materials as well as expansion of plant facilities. He has been with Detrex for the last six years.

Henry D. Mercer, president, States Marine Corp., was elected to the board of directors of **Republic Steel Corp.**, Cleveland, to succeed **Thomas A. O'Hara**, resigned.

C. D. Barr, since 1946 president, **American Cast Iron Pipe Co.**, Birmingham, was made chairman of the board. **C. Otto Hodges Sr.**, executive vice president, becomes president. **J. W. Woody** was made vice president-production; **A. E. Bowen**, treasurer; **F. H. Coupland**, works manager; **B. B. Warren**, assistant works manager in charge of personnel and public relations; and **J. T. Vann**, assistant works manager-operations.

Roy A. Allen was promoted to sales manager, and **Miss Marion E. Graff** as assistant sales manager, **Rich Steel Co.**, Los Angeles.

Jules Alexandre was appointed sales manager, **Appliance Mfg. Co.**, Alliance, O.

John A. Brossart Jr. was appointed assistant vice president-production, **Standard Railway Equipment Mfg. Co.**, Chicago. He is at the Hammond, Ind., plant of the company where he was works manager.

William H. Funk, associated with the development engineering department, **Lukens Steel Co.**, Coatesville, Pa., since its inception in 1945, was named assistant manager of the department.

Charles W. Sanford was appointed works manager, **Jack & Heintz Inc.**, Cleveland. He was assistant works manager for Whirlpool Corp. for the last six years.

Robert L. Fowler retired as chairman of the board of **Florence Stove Co.**, Chicago. He was president of the firm from 1931 to 1945.

Jackson & Church Co., Saginaw, Mich., named **Francis W. Hoye** director of engineering and **Dr. Harold E. Graves** as director of chemical engineering. Mr. Hoye is former head of mechanical engineering departments at University of Rhode Island and Syracuse University. Dr. Graves headed the chemical engineering department at Rhode Island.

Roddy M. Pile was appointed district manager, Cleveland office, **Century Electric Co.**

Eugene H. Neff was named southern district sales manager, **Apex Electrical Mfg. Co.**, with headquarters in Birmingham.

Leonard T. Sylvester, president and managing director, Mathews Conveyer Co. Ltd., a Canadian subsidiary of **Mathews Conveyer Co.**, Ellwood City, Pa., was elected president of the parent company. **Odd H. McCleary**, vice president, was elected vice president-general manager. **Lee Sekulski**, sales manager, was elected to the board of directors. Mr. Sylvester continues as president of the Canadian organization. He succeeds the late **William L. Dean**, who was president of

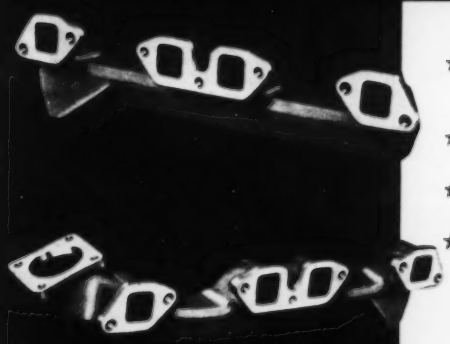
JOHN P. EMMETT
heads new dept. at Detrex

WILLIAM H. FUNK
asst. mgr. Lukens dev. engineering

LEONARD T. SYLVESTER
elected president, Mathews Conveyer

Another Special by Cross

Mills, Drills Bores, Chamfers and Taps Exhaust Manifolds



★ Mills and drills mounting face; mills, bores, drills and taps tail pipe pad on 120 exhaust manifolds per hour at 100% efficiency.

★ Right or left hand parts machined without changing setup.

★ Six stations—one for loading, two for milling, two for drilling and boring, one for tapping.

★ Other features: Power indexing; hydraulic feed for milling, drilling and boring; individual lead screw feed for tapping; hardened and ground ways; JIC standard construction; pre-set tools.

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DETROIT 7, MICHIGAN

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sales mgr. stainless, U. S. Steel

JOHN W. MERYDITH
asst. sales mgr. at Fageol

CARL A. SALMONSEN
mgr. of GE's new industry control dept.

Mathews Conveyer Co. and a member of the board.

John S. Ewing was appointed manager-stainless steel sales, **United States Steel Co.**, Pittsburgh, effective Mar. 1. He succeeds **Paul F. Voigt Jr.**, retiring after 16 years with U. S. Steel and 42 years in the steel industry. Mr. Ewing has been assistant manager of the stainless steel division.

C. L. Hoebner was appointed general manager of the West Coast division of **Trailmobile Inc.** His headquarters are in Berkeley, Calif.

John Senft has been engaged by **Hodell Chain Co.**, Cleveland, division of National Screw & Mfg. Co., as consultant in its engineering department.

John W. Merydith was appointed assistant sales manager, **Fageol Heat Machine Co.**, Detroit. He was formerly with the sales department of Amco Corp.

John W. Brigham was appointed general sales manager, **Baker Bros. Inc.**, Toledo, O., and **John P. Nugent** becomes assistant sales manager.

Dean B. Skillin was added to the sales staff of **Continental Screw Co.**, New Bedford, Mass. He is assigned to Indiana and Wisconsin territory.

E. Nelmes Thomas was named manager of the newly formed sales development department, **Chiksan Co.**, and will make his headquarters at the main plant in Brea, Calif.

Carl A. Salmonsen was appointed general manager of **General Electric Co.'s** newly formed industry control department, with headquarters in Schenectady, N. Y. The new department will be a component of the switchgear and control division. Mr. Salmonsen has been manager of manufacturing in the former large apparatus division.

E. W. Bliss Co. announces a direct representative in western Michigan with appointment of **William Carlson** as sales engineer. His office will be at the Bliss plant at Hastings, Mich.

Robert G. Clark, office sales supervisor, **Riverside Metal Co.**, Riverside, N. J., was transferred to the company's Newark, N. J., office to assist **F. M. Shelley Jr.**

OBITUARIES...

O. F. Merwin, 79, founder and chairman of the board, **Eriez Mfg. Co.**, Erie, Pa., died Feb. 19. He is credited with designing the magnetic separator machine.

Alex Morton, 58, superintendent of construction, **Freyn Engineering Co.**, Morrisville, Pa., open hearth plant of U. S. Steel Co., died Feb. 13 at his home in Trenton, N. J.

Philip W. Hall, 75, a developer of the rapid rotary lithographing press and former president, **Hall Printing Press Co.**, Dunellen, N. J., died Feb. 17.

George R. Sullivan, Philadelphia sales manager, **Hanna Furnace Corp.**, Detroit, died Feb. 25.

Dr. Fred F. Fitzgerald, 69, director of research for **American Can Co.** from 1935 until retirement in 1942, died Feb. 7 at Joliet, Ill.

John W. Decker, 55, sales manager, **Carrick Products Co.**, Detroit, died Feb. 11.

Fred W. Roberts, 76, president, **F. W. Roberts Mfg. Co.**, Lockport, N. Y., died Feb. 18.

A. W. Hellstrom, 64, founder and president, **Hellstrom Corp.**, Chicago, died Feb. 20.

R. W. Frawley, assistant general sales manager at Birmingham for **Republic Steel Corp.**, died Feb. 16.

Clarence A. Pattison, 83, president, **Peoria Malleable Castings Co.**, Peoria, Ill., died Feb. 19.

T. W. Anderson, 67, sales engineer, **Exothermic Alloys Sales & Service Inc.**, Riverdale, Ill., died Feb. 16.

Charles E. Johnson, 76, cofounder and president, **Sealed Power Corp.**, and founder and president of Johnson Products Co., Muskegon, Mich., died of a heart attack Feb. 13.

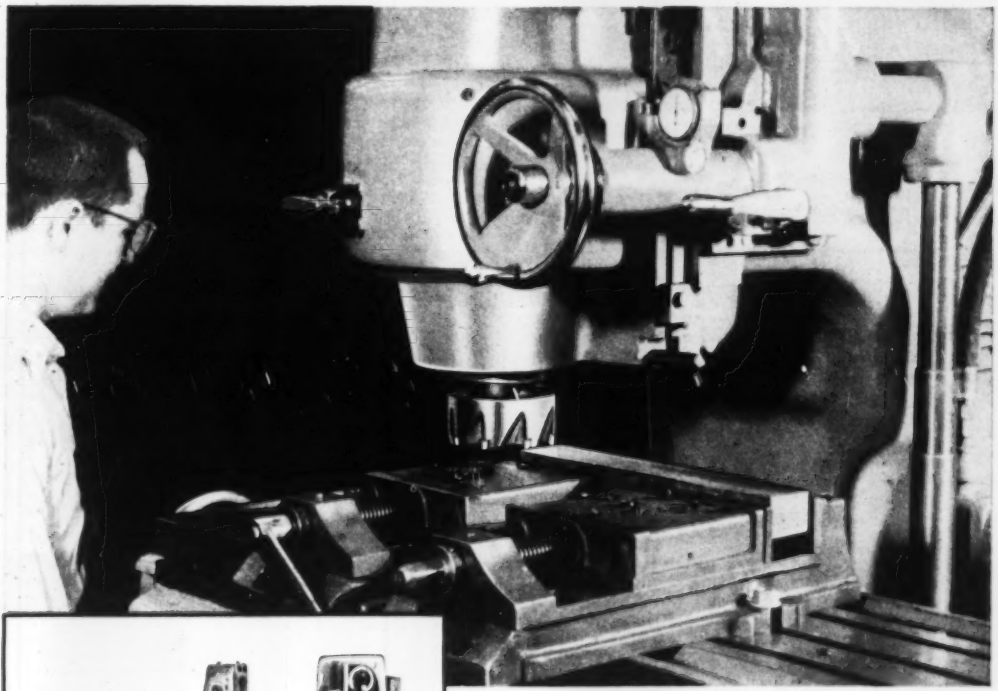
James T. Powers Sr., 60, president, **Funk Forging Co.**, Chicago Heights, Ill., died Feb. 16.

Walter J. Mullally, 62, sales engineer, **American Manganese Steel Division**, American Brake Shoe Co., Chicago, died Feb. 17. He had been with the company 25 years.

Arno W. Gaebelein, 61, vice president, **New Britain Machine Co.**, New Britain, Conn., died Feb. 24.

FACTS TELL THE STORY...

NEW CK MILLING MACHINE CUTS PRODUCTION TIME 75%



C-K MILLING MACHINE FEATURES THAT HELP DO THIS JOB BETTER

New CK column easily absorbed vibration from heavy cutting load.

Greater horsepower permitted maximum results from modern cutter.

24 different spindle speeds (13 to 1300 rpm) plus 32 different table feeds (⅛" to 90" ipm) meant operator selected proper combination to take full advantage of high horsepower and modern tools.

CK's 3-bearing spindle and flywheel assured fast metal removal, excellent finish.

CK's large (2" dia.) table feed screw gives greater bearing contact for smoother feed.

CK's positive, metered lubrication assures trouble-free operation.

The FACTS on this job are:

Operation: Face mill four sides
Workpiece: Ram for slotting attachment
Material: S.A.E. 4615 forging — 2¼" x 2¾" x 18½"
Machine: New 25hp No. 4 CK vertical
Cutter: 6" dia., 8 Tooth Carbide Face Mill with 7° negative primary rake angle.
Cutter Speed: 275 rpm **Depth of Cut:** ¼"
Table Feed: 25 ipm **Machining Time:** 3.8 minutes
Total Saving in actual machining time: 11.9 minutes or 75.8%

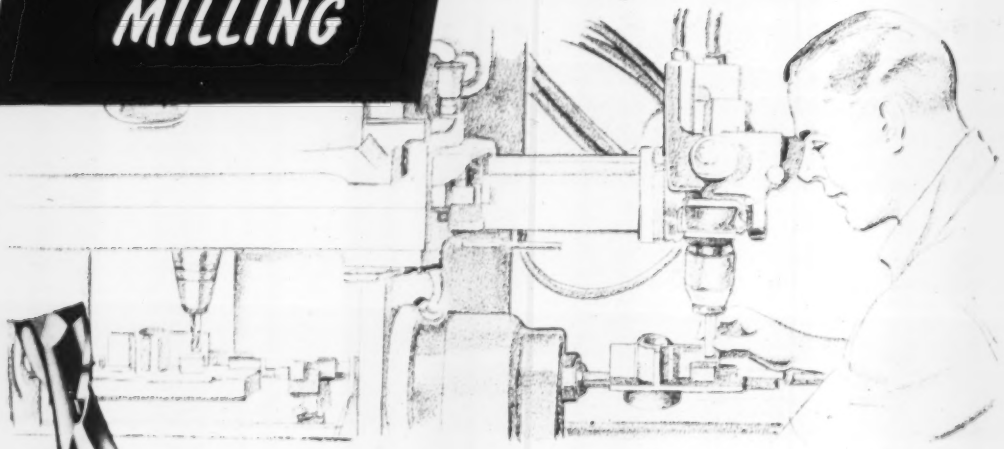
NOTE: Part machined is the operating ram used in a slotting attachment. It must be tough and accurate. It is milled to a semifinish state and finish ground to final accuracy.

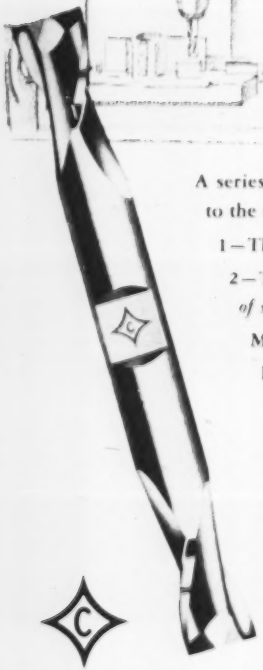
It will pay you to see the new CK line of milling machines — check them against your own requirements. You'll notice how every feature is designed and job-proven to give you cost-cutting results — greater machine capacity, productivity and better finished products. So, for the full story, contact your nearest Kearney & Trecker representative or write: Kearney & Trecker Corp., 6784 W. National Avenue, Milwaukee 14, Wisconsin.

KEARNEY & TRECKER MILWAUKEE MACHINE TOOLS

HIGH SPEED MILLING

WITHOUT LOSS OF SURFACE FINISH





A series of tests on a template follower job, illustrated above, proved conclusively to the user that *Cleveland* End Mills have two outstanding features:

1—They possess *unusual chip clearing ability.*

2—They permit the use of higher speeds and feeds than other mills *without loss of surface finish or tool life.*

More than two years ago the entire line of *Cleveland* End Mills was completely redesigned. Since that time they have been tested repeatedly in customers' plants—and always have been found superior in chip clearing, accuracy, strength, durability, long life and cutting speed. If *you* have not experienced the many advantages of these tools, we urge you to . . .

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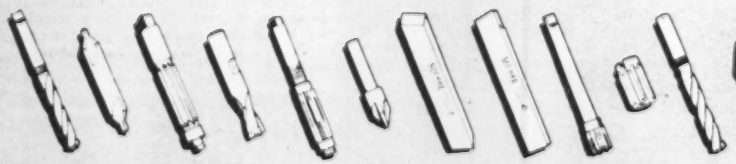

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DISTRIBUTORS EVERYWHERE are ready to serve you

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Production and Engineering
NEWS AT A GLANCE

TWO-WAY STRETCH—A 3 million-pound capacity straightening machine will complement Alcoa's new 13,200-ton extrusion press at the company's Lafayette, Ind., plant. The new stretcher exerts a force comparable to a tug-of-war between 19 three-unit diesel locomotives on each team with a large aluminum aircraft extrusion in the middle. Since extrusions often warp during the manufacturing process, the stretcher will straighten them out—up to a cross-sectional area of 60 sq in. in the strongest aluminum alloy.

HANDLE 'EM CAREFULLY—New furnacing and casting techniques are used to process rarer metals like tantalum, columbium, zirconium and titanium. These metals cannot be furnaced and cast in the usual way because they all have a strong affinity for oxygen and nitrogen. They form irreversible oxides and nitrides. Consequently, high vacuum methods and inert gas atmospheres are needed. In the design of equipment for handling the rarer metals, all materials should be tested and chemically analyzed to determine their suitability. p. 76

WELDABLE MAGNESIUM—Most weldable magnesium alloys are those having less than 7 per cent aluminum and not more than 1 per cent zinc and the M-1 alloy which contains 1.5 per cent manganese. Alloys of 7 to 10 per cent aluminum and 1 per cent zinc can be welded with little or no difficulty but are considered slightly hot-short. Zinc in amounts over 1 per cent increases hot-shortness and causes weld cracking.

SLOW DOWN GRINDING WHEELS—Titanium, whether commercially pure and soft, like Ti-75A or modercetely alloyed to strengthen or harden it, like RC-130B or Ti-150A, is difficult to grind. It wears the grinding wheel fast, by some sort of surface reaction with the abrasive grain, probably for the same reason molten titanium reacts with all known refractories. According to a Norton Co. report the high rate of wheel wear can be overcome by using slow wheel speeds.

CUTTING WIND SLICES THIN—A pocket of compressed air moving ahead of a knife blade revolving at 65,000 rpm is being used to slice metal shavings 1000 times thinner than a human hair. This cutting wind rips out microscopic pieces of metal or other material, allowing the knife blade to pass through without actually touching the material. The knife mounted on a wheel in a high speed microtome whirls at 1200 fps, or more than 818 mph, faster than the speed of sound. Developed at GE's research laboratory, the device is being used to cut thin cross sections for study under an electron microscope.

MORE DUCTILE CAPACITY—Production of ductile iron jumped to more than 50,000 melt tons in the U.S. and Canada in 1951. This figure compares to approximately 3500 melt tons in 1949, the first year of commercial production—and to 20,000 tons in 1950. One hundred companies operating 300 foundries are licensed to produce ductile iron.

MAINTENANCE INGENUITY—Imaginative maintenance is keeping many a metalworking plant in full production during these days of overworked equipment, machinery shortages and slow deliveries. Every maintenance job is a rush job. Ingenuity can spell the difference between continued operation and costly delays. p. 79

PROBES FOR FLAWS—Quality of steam turbine, centrifugal pump and hydraulic castings will be diagnosed by a 22 million volt x-ray machine at Allis-Chalmers' West Allis, Wis., works. The machine can detect flaws in steel to a depth of 24 inches. The concrete x-ray room will be big enough to accommodate a railroad car and a bridge crane capable of handling 25-ton castings. Walls 6 feet thick will protect personnel from radiation.

360-DEGREE PHOTOS—Foundation problems in construction of concrete structures may be solved by a new camera that can take 360-degree photographs of a 3-inch bore hole. The cylindrical camera uses a conical mirror to produce an image of a 360-degree band of the bore hole photographed on 16 mm motion picture film. Pictures are projected on a conical screen enclosed in a cylindrical diffusion screen. The camera can be used in either dry or water-filled holes.

MORE PRESSURE, LESS COKE—Nine blast furnaces in this country are equipped for high top pressure operation. The Soviets, recognizing the advantages of the new technology have six furnaces converted to high pressure practice. Average production increase from the same shaft volume is 20 per cent; coke consumption per ton of iron is down 11 per cent and dust loss decreased 22 per cent. p. 84, p. 89

Metalworking Outlook—p. 39 *Market Outlook—p. 159*

Rare Metals Require Precision Furnacing

Casting and melting procedures for the commoner metals do not apply to their rare brothers. Attention to revised concepts, techniques assures a satisfactory product

By FRANK GIBADLO
President
Process Chemical Specialties
Beverly, Mass.

PRECISION results from furnacing and casting rare metals make employment of high vacuum techniques and inert gas atmosphere mandatory. Ti, Zr, Ta, Cb, U, Th, Ca, Mg all have a strong affinity for oxygen, nitrogen and form irreversible oxides and nitrides. They react with carbon dioxide, sulphur dioxide, water vapor to form compounds. Hydrogen is strongly adsorbed. Traces of these gases cause hardness, unworkability and reduced ductility. Some adsorbed gases, principally hydrogen, will be released on heating in subsequent vacuum operations a condition particularly undesirable in the electronics industry.

Vacuum procedures are also used for evaporating metals and condensing them as a film on various articles to produce a fine finish. Under vacuum, evaporation and boiling temperatures of the metals are lowered.

Often vacuum treatment of rare metals possessing high vapor pressures and boiling points, is done with lower boiling metals such as calcium, magnesium, aluminum and tin. At the higher operating temperatures required, the latter metals tend to evaporate and boil —in some instances so rapidly that severe vibrations of the furnaces are experienced. These metals condense as fine pyrophoric powders upon the cooler surfaces of the system. Powders on contact with the atmosphere tend to flash and burn producing great heat. Operators should be skilled to remove the finished furnace products and should be aware of the attendant hazards from flashing burns.

Condensation of these pyrophoric powders can be minimized by an atmosphere of helium or argon at sufficient pressure to suppress vaporization. Condensation of metal may be localized by equipment shown in Fig. 1. Product is in container (C) which is inside of an inverted cylinder (X) resting on a pan containing a suitable refractory oxide such as Ti_2, Zr O_2, Fe_2O_3. If magnesium metal is included in the product, its vapor on subsequent furnacing is trapped by the oxide.

The Container Problem — New problems arise during melting and casting of rare metals. It is not feasible during melting to use conventional metal containers since they will melt, react and alloy with the product. In casting, rare metals will react with constituents of ordinary molds, resulting in problems of casting removal. Ceramic containers will react and fuse, producing a contaminated product. Coating ceramic containers with a liquid to prevent fusion and adhesion is unsatisfactory. Ingredients do not prevent adherence; volatile organic solvents introduce carbon and hydrogen into the metal.

When commercial grades of 20-60 mesh magnesium, aluminum or calcium metal are heated in vacuum or in atmosphere of He or Ar

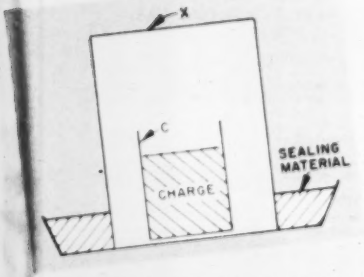


Fig. 1—Method of minimizing diffusion of gases, vapors during furnacing

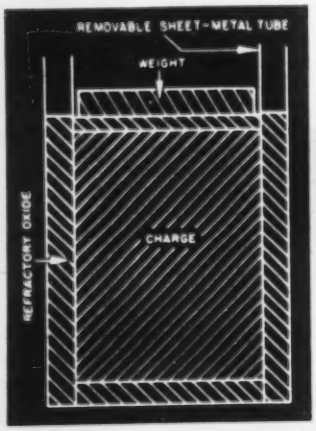


Fig. 2—Lining of refractory oxide protects container for melting a powdered charge. Tube holding back refractory is removed after charge is poured

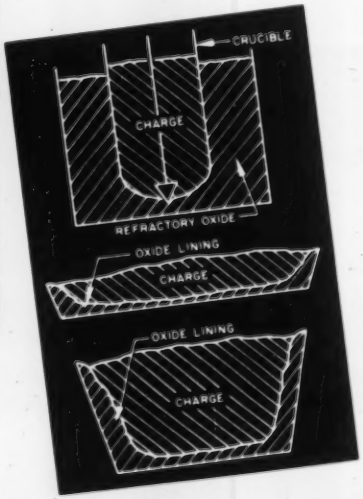


Fig. 3—Lining that can be used for a powdered or molten charge. Crucible supports refractory, is raised as charge flows through hole to fill cavity

several hundred degrees above respective melting points, no apparent melting of the powders occurs. It is believed particles are covered with a coating of impurities, which creates a high interfacial tension preventing them from coalescing. A piece of the metal placed in the powder initiates melting. To help overcome this interfacial tension, and to minimize porosity and cavities, a suitable weight of steel is placed upon the charge prior to furnacing. Weight should have specific gravity less than the product, so as not to sink too deeply, squeezing and compacting the molten metal.

Another Solution—Fusion of the product and container can be solved by another method. If zirconium and magnesium powder are to be melted, Fig. 2, a sheet metal tube is placed concentrically within a steel receptacle. Space between tube and receptacle wall and bottom of tube is filled with fine refractory oxide. Tube is filled with the mixture of 20-60 mesh magnesium and 200 mesh zirconium. Tube is withdrawn leaving magnesium and zirconium mixture surrounded by an oxide layer. A weight, in this instance a carbon disk, is placed on top, separated from the charge by a layer of oxide. After furnacing, the product is removed with ease. Refractory oxide is partially reduced and is simply removed by wire brushing or by a blast of air. Oxide may be reused as a lining material.

For a variation of this method, Fig. 3, a crucible with a plugged hole in the bottom is embedded in the refractory oxide. It is elevated gradually with plug removed. Metal either in powdered or molten stage gets deposited in space created by crucible.

Illustrated in Fig. 4 is an integral unit in which ingots can be cast in vacuum or in inert gas atmosphere. Crucible (A) is heated by high frequency. Casting container (C) in the lower cooling zone contains a sheet metal tube with a refractory oxide around it. Bottom is covered with a thin layer.

To prevent any disturbance of this layer from the first splash of molten metal, a thin disk of same composition metal serves as a baffle. Stopper is pulled out to release the molten metal into container (C). Tube (S) is slowly raised out of container leaving the molten metal surrounded by refractory oxide. Detachable bottom opening permits removal of casting. To prevent the infiltration and diffusion of air into the top zone the gate valve (G) is closed.

The Diffusion Problem—Importance of the effects of gas diffusion is exemplified in furnacing hydrides of the rare metals such as Ti, Zr. Hydrogen gas is produced as a decomposition product, and is bled off at top of retort, Fig. 5, for 8 hours at a gage pressure of 1 inch. Resultant furnace products show a nitrogen content ranging from 0.7 to 1.2 per cent. When hydrogen is bled off at two to three pounds retort gage pressure, final nitrogen content ranges from 0.2 to 0.4 per cent. Excess nitrogen results from diffusion through the retort walls of the flue gas which has a temperature of 950 to 1000° C and a slightly higher pressure (2-4 inches) than inside retort pressure. Rate of diffusion through metals increases very rapidly at high temperatures. Vacuum tight closures at room temperatures are not necessarily so at high temperatures.

Effect of slight leakage upon a reaction process is evident during hydriding of rarer elements. Reactions proceed uniformly in a tight atmosphere of hydrogen gas at a gage pressure of approximately 5-15 pounds at a temperature of 400° C. Whenever pressure within the retort falls slightly below atmospheric, hydriding reaction ceases. Reason is formation of an impervious oxide and/or nitride coating upon the furnace products by diffusion of the atmosphere into the retort.

Concepts Differ — Treatment or reduction of metals stems from application of the general axiom that oxygen content of metals and alloys is reduced or removed by elements having a higher affinity or higher heat of oxide formation than the base metal. Application of this axiom for rarer elements should be checked carefully, otherwise unexpected results may be obtained.

Although MgO has a heat of formation of 144 calories, the base metal Mg will not completely reduce TiO_2 (heat of formation 109 calories) to the metallic state, but only partially reduce it to a sub oxide. In contrast, ThO_2, having a heat of formation of 165 calories per atom of oxygen, is readily reduced by Ca and CaH_2 to Th metal. Ca has a lower heat of formation—152 calories. CaH_2 pulverized prior to use much easier than Ca metal. Heating CaH_2 at reduction temperature of 900 to 1000° C gradually decomposes it into Ca metal and hydrogen gas.

Test Design, Material — Strong consideration should be given to initial design of equipment for processing rarer metals. This includes the selection of proper alloy composition of retort to minimize hot flue gas corrosion, warping by heat, chemical reaction of retort with products being furnaced. Much time and effort is saved, if preliminary work is tried out in experimental laboratory units.

It is mandatory that all mate-

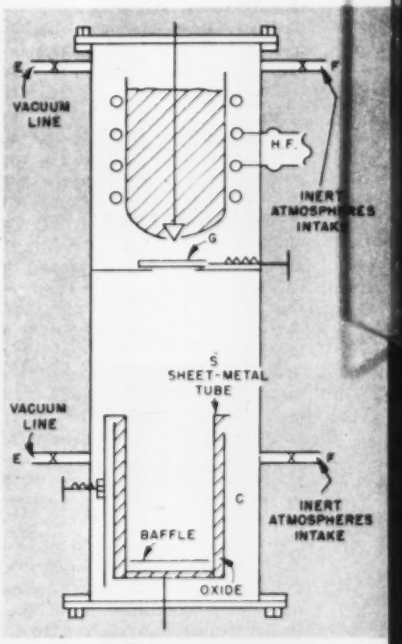


Fig. 4—Integrated high frequency melting and casting unit. Sheet metal tube is raised as molten charge is released in vacuum or inert gas atmosphere

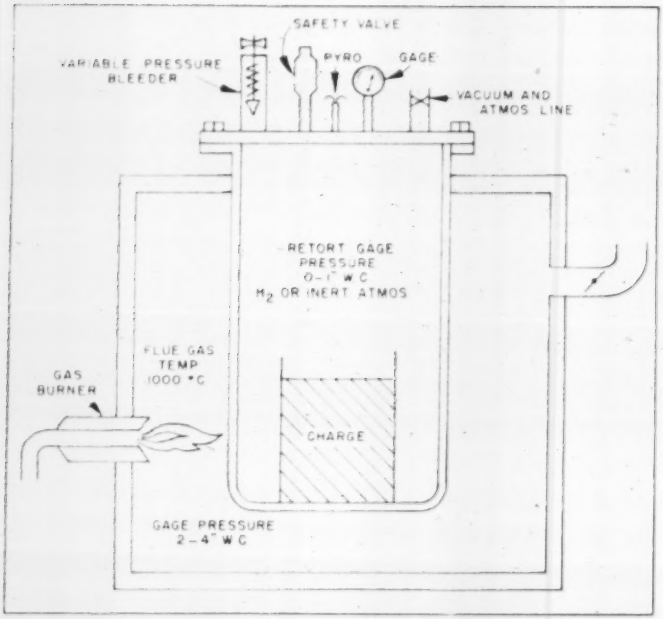


Fig. 5—Vertical type retort for furnacing hydrides of the rare metals

rials be tested and chemically analyzed to determine their suitability. Most important is determination of water content and organic volatiles. This includes physically adsorbed water, and water of hydration released at temperatures higher than boiling point of water. Presence of organic compounds should be determined. Water and organic compounds should be at a minimum. If present in sufficient amounts the latter will produce a hazardous explosive situation in the presence of rarer elements, particularly Ca and Mg. When heated, they will cause a rapid reaction producing expanded volumes of gases at extremely high temperatures. Presence of water and organics tends to produce undesirable impurities such as hydrogen, carbon and nitrogen, which deter final physical characteristics of products.

Degassing of undesirable constituents in processing materials, crucibles and auxiliary components may be accomplished by a preliminary heat and vacuum treatment prior to use. All gaseous atmospheres used in processing should be free from impurities, otherwise these impurities tend to be cumulative in the desired products.

Some thermal reductions of the metal oxides are carried out by the replacement of the oxygen by an active metal reducing agent.

Inspection Time Pared

Cobalt 60's speed, higher specific activity and lower cost offer inspection advantages

NONDESTRUCTIVE inspection for soundness of large castings with $1^1/_2$ to 2-inch wall thickness formerly took eight to ten days using radium. Now, according to A. S. Grot of the research staff, Edward Valves Inc., subsidiary of Rockwell Mfg. Co., radioisotope cobalt 60 cuts down the time to 24 to 36 hours.

Another reason why cobalt 60 has replaced radium for internal type of examination, is its availability in higher specific activity than the natural radium. This makes it possible to use smaller source size, and increase sensitivity in examination of confined areas of valve castings.

Lively Wire—Consisting of activated pellets of metallic cobalt, it is normally made from wire of predetermined diameter that has been cut to lengths approximating the diameter. These metallic cobalt cylinders are placed in atomic piles and eridiated for 10 to 12 months. The result, upon removing the metal from the atomic pile, is cobalt 60.

"Examination of castings for internal soundness," Mr. Grot says, "may be determined through the use of x-ray, radium, cobalt 60, or any other activated source capable of emitting rays of high penetrating power. Any of these may be used for nondestructive inspection, so long as they have the required ray characteristics to penetrate the material."

X-ray equipment of sufficient capacity to penetrate metal, particularly in heavy sections, becomes cumbersome in operation, Mr. Grot says. If the item to be examined is a cylindrical vessel or sphere of confined internal dimensions, x-raying of this hollow type vessel requires placing the film one section at a time and exposing each individually. In order to make a complete circumferential examination, it is necessary to rotate the vessel.

Speed and Economy—On smaller diameters, radioisotope cobalt 60 is not only equal to x-ray for internal inspection of castings, but also faster and less costly. These advantages are made possible by wrapping the film in continuous envelopment around the vessel and central placement of the activated source. The result is simultaneous exposure of all films.

Tests over a long period of time in the company's laboratory at E. Chicago, Ind., indicate that the sensitivity increases as the activated source size decreases. With radioisotope cobalt 60, sensitivity need not be sacrificed to attain speed on exposure.

Because of its possible higher built-in activity, radioisotope cobalt 60 can be 10 to 25 times as small as a radium capsule and still allow reduction of exposure as much as 10 to 15 times. Using the same size source as radium or other activated medium, cobalt 60 produces similar results in less "in process" time at radiographic inspection.

Machine Maintenance:

Production Can't Wait

One answer to equipment shortages, delayed deliveries and overworked machinery is imaginative maintenance. Here's how an aircraft plant keeps facilities at peak efficiency

Studs fastening steel frames to concrete floor are driven by an explosive .38 caliber rivet gun. Stud is circled

INGENUITY is called for these days to keep machinery in a defense plant going. New equipment sometimes can't be had for months ahead but production must not lag. So the maintenance men play a more important role than ever, saving time as well as money.

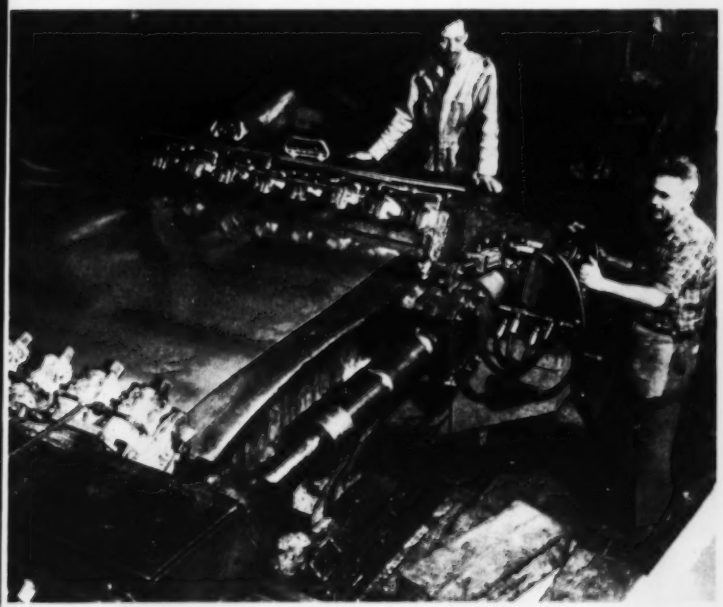
To the maintenance men at the Glenn L. Martin plant, Baltimore, falls the day and night job of keeping the plant running. Many skills are involved — millwright, welder, mechanic, painter, carpenter, pipefitter, electrician.

Machine repairmen, working from drawings developed by the tool engineering department recently beefed-up a sheet-metal stretch-press, by a hydraulic ram. There was nothing wrong with the press. It just wasn't rugged enough to handle the heavier gage aluminum skins called for by a certain new airplane. To await delivery of the bigger machine on order would have meant a costly delay. The ram compensates for the overload on the gripper jaws—and the stretch-press carries on.

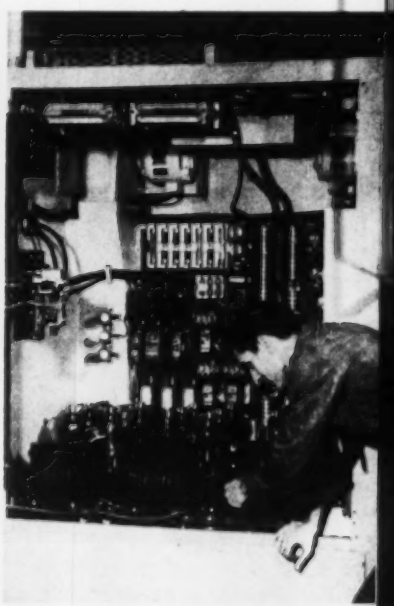
Night Work—So that production may not be interrupted by the necessary shutdown during a machine's repair, nor by curiosity in the shop during the ministrations of a servicing crew, overhaul of equipment on the floor is usually reserved for nights, holidays and weekends.

Other of the aircraft-building economies are being effected by wrench and lathe, paint brush, welding arc and hammer.

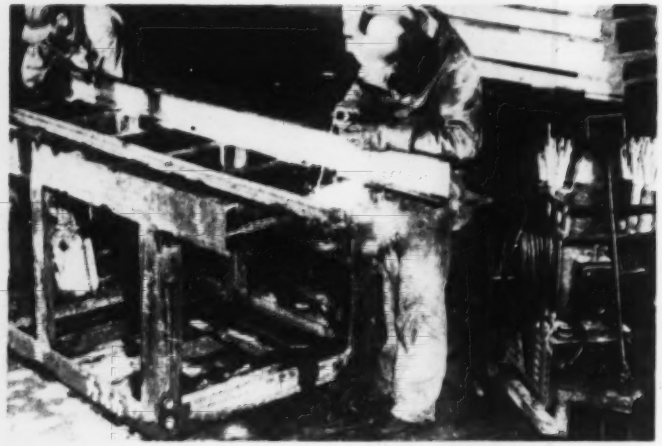
Wedge-and-stem element in an alligator squeezer was formed by



Hydraulic ram (right-center, foreground) installed by maintenance men between tables supporting opposed banks of jaws, relieves overload and enables stretch press to handle heavier gage sheet than originally specified



Repairman checks circuits in cabinet that houses the electronic control mechanism of a spot welding machine



Millwrights and welders are responsible for construction, overhaul and repair of plant equipment. Demand for their services is increasing

this tool's manufacturer from a single piece of steel—hogged out of bar stock. When a stem was broken, the wedge part had to be scrapped too. Martin maintenance machinists fashion the replacement in two parts. The wedge is annealed and counter-bored. Then a new, separate stem—with a threaded stud at its base—is seated in the salvaged wedge.

When lead pigs were listed in short supply recently, all maintenance groups were advised to make out, wherever possible, without spelter. Here is an example of what was done about it. The customary leaded-in floor fastenings were discontinued in connection with new installations of machinery. Grouting cement is now poured as a substitute for molten lead and is proving satisfactory in this use.

Maintenance machinist processing wedge part of alligator squeezer tool

Pressurized Operation—Maintenance men have to bear up under pressure on scores of rush jobs every day. The company's stock of rivets ran so short, a while ago, when deliveries failed to come through—that an obsolete rivet sorter was resurrected to help screen the sweepings from the assembly floor. The sorting machine, unused for years, was refitted and put in working shape overnight.

As for salvaging critical sheet metal, such items as light reflectors and radiator shields are made of scrap aluminum skins. Power panels and junction boxes are contrived from outmoded metal templates. Precision parts for shop tools, when temporarily unavailable, are made right in the plant. Thus, in recent weeks, rotor shafts and replacement bearings for the high-speed rivet-head shaver tool represent a case in point—and the little shavers still function fine.

Here's an example of the millwright's ingenuity when faced with the proposition of fastening steel assembly conveyor track to concrete flooring. Thousands of tedious holes formerly would have been drilled through the steel—then expansion bolts inserted into the concrete. But now, using a tapered stud, explosion-driven by a .38 caliber rivet gun—the track is laid as rapidly as the floor can be prepared ahead of it. In case the gun barrel begins to show wear, of course, the maintenancer can always double in brass—by reboring.

Prefab Crib Ups Flexibility

Prefabricated fence panel developed by Texas Engineering & Mfg. Co. Inc. lowers erection costs on crib and warehouse fences and enhances the appearance at the firm's Dallas plant. The company attributes to the panel a neat, uniform appearance and says it causes no waste while being moved or rearranged. In use, it provides quick access to any part of a crib for moving large bins and is designed for quick erection to specified dimensions, even for temporary use.

Panels are 8 feet high, fabricated in 4, 6, 8 and 10-foot lengths to give flexibility in dimensions. Each has a welded framework of $1\frac{1}{4}$-inch pipe, a horizontal brace of 1-inch pipe midway between top and bottom and 2 x 4-inch No. 11 galvanized welded wire fabric mesh covering. Standard units include those with door and window provisions.

Material cost of the prefab type is placed at about double that of wood and wire fencing; initial fabricating costs, 50 per cent higher. Company maintenance officials hold this is more than offset by the fact that ready-made sections can be moved and reused indefinitely without material waste. They add that once fabricated, their units can be installed at about half the cost of types they used previously.

Radiation Detectors Covered

Bulletin on ten recent nuclear radiation detectors has been announced by General Electric Co. Schenectady, N. Y. Designated GEA-5735, the illustrated booklet covers the GE radiation monitor, scintillation counter, portable radiation probe, area health monitor, long-probe gamma survey meter, alpha hand counter, air equivalent ionization chamber, boron-coated counter tube, thermocouple vacuum gage, and step-motor impulse counter.

Flexibility Key to Production Control System

Beset with a thousand unpredictable manufacturing variables a builder of steel partitions and ceiling panels makes special order and production control system pay off

By W. J. LONGWORTH
Manager, Scheduling Department
E. F. Hauserman Co.
Cleveland

PRODUCTION planning and control can be complicated when one order calls for $1000 or more of steel partitions and ceilings for delivery over a period of six months two years from now and the next one requires $100 worth for delivery "day before yesterday". That is only a small part of the difficulty E. F. Hauserman Co. overcomes as a matter of course under its new production control system.

No Average Job—Every installation of steel partition is special. Even though the company has standardized components, and uses mechanized processes as much as possible, it cannot manufacture finished partitions in advance of orders.

Each must be engineered to fit the space and conditions of use, provided with the required electrical outlets and connections, fitted with the proper hardware, and painted or grained to the customer's specifications.

Detail work on each order is enormous. Drawings, bills of materials and specifications must be written for each order. Some of them are extremely complex; even the relatively simple ones are voluminous. Opportunities to simplify engineering have been exploited by reducing components to types and preparing preprinted specification sheets on which quantities and descriptions of special components entered.

Some criterion must be used as a basis for planning production and loading the plant. The best one at the Hauserman plant is the "paint car" or overhead conveyor frames on which components move through the paint job before final assembly and shipping. Number of paint cars that can be processed per week is known and so the plant is loaded on a weekly basis working backward from planned erection date to put orders into the paint shop to allow for fitting hardware, crating and transit time.

Almost every plant has a similar key operation that can be used for production scheduling and control. If material gets through that critical point on time it will meet schedules. Then, to assure meeting schedules it is merely necessary to enter production orders so that successive operations in the manufacturing cycle are performed to bring that order to the key or critical department and complete it on time.

Out of Sight, Out of Mind—To be successful, any such system must enable the production control men to know the position of all orders to forestall delays. The more easily and certainly it points out exceptions before they occur, the more practical and valuable it is.

The production control system used for the last 20 years is entirely sound in principle. The paint shop, and therefore the plant, was loaded week by week for months in advance. This principle—and the media used — have been carried over bodily to the system now adopted. Loading was done by putting folded copies of work orders in pockets on boards mounted on the walls of the production control office.

The orders were inserted in the pockets or slots so that only order number was visible. This meant that to get needed information, it was first necessary to locate the order by number and then to remove and unfold it.

Reference Easy — Production planning and control in this complex manufacturing operation must allow flexibility for revisions and emergencies. Unforeseen delays in obtaining materials, bad breaks on weather and other things may cause customer contractors to be delayed in their particular operations.

Thus, they might postpone erection by Hauserman field crews of the ceilings and partitions, making it necessary for the plant to set back production to a new schedule. On the other hand, a job may move

Order forms are easily located in the Kardex file mounted on a rotary stand

more rapidly than expected so that advanced delivery is desirable.

To handle the order-juggling a special system was worked out. Remington Rand Kardex panels and forms were selected. An index visible rotary stand was chosen as the housing, to bring all orders within sight of the men working on production control as they sit at their desks. To mount the panels on the rotary, the company built light strong sheet metal racks that fit the rotary and are mounted on double-jointed hangers so adjacent panels can be brought together and hung in the same place. Now it is no longer necessary for the men to leave their desks and search the boards to locate an order they want.

Salient information appears in typescript or signals. Where more details are needed, they can be obtained from the order copy tucked in the Kardex pocket. Panels can be lifted out of the rotary and laid flat on a desk when a group is being analyzed or planned.

Orders were formerly arrayed in the wall board by week by order number, so that location was slow. In the revised system, orders are set up by week, by branch office, by number with orders on which some data are lacking separated from those which are completely documented.

Visible margins are created from continuous forms having detachable stubs at either end, to bring contract number to the outer margin of the panel on the rotary stand for quicker order location. Orders from different branches are marked off by heading cards. Since it is usual to break an order down into more than one billing, value of the sale is shown only on the margin in which the work order for the first billing appears. Value of each billing shows on the pocket carrying its work order. Thus, value of weekly work loads can be totaled easily and balanced back to the control figure for unshipped orders.

This refined system is effective because it is able to mark the exceptions and to depict visibly and clearly status of the plant of any order or billing without prolonged analysis of blindly filed papers that must be found, removed and replaced.

By S. L. JOHNSON & R. G. HALL
Abrasives Division
Minnesota Mining & Mfg. Co.
St. Paul

The result. Dark piece was cut from tempered, drawn steel strip before scouring to remove annealing oxides

Smooth Finish For Strip . . .

Moving Abrasive Produces It

Coated abrasive paper progressively fed over moving steel strip produces variety of finishes, cleans, scours surface evenly on both sides simultaneously

SCOURING steel strip is a technique gaining adherents among strip producing mills. Process consists of scouring both sides steel strip simultaneously with progressively-fed coated abrasive paper. Result is a uniform surface over the entire length and width of the strip.

Idea was pioneered by H. R. Herchenrider of Minnesota Mining & Mfg. Co., who invented and patented the first scouring equipment, used in regular production by two mills before the war. Application was to remove pickle etch and superficial imperfections from stainless strip before bright rolling for auto trim and cutlery stock. Silica strip for electrical purposes was descaled by strip scouring.

Strip scouring contrasts with the drag pad method in which 9 x 12-inch sheets of abrasive or wider roll stock were fixed to stationary resilient blocks. Steel strip was pulled past the abrasive under pressure. The abrasive filled and had to be replaced.

Filling or dulling of abrasive is avoided with strip scouring because constantly moving strip brings a fresh abrasive surface into contact with the steel. Abrasive strip is snubbed around a rubber roll to provide a point contact with the steel. Snubbing provides accurate control of the abrading action and a high unit pressure, which allows maximum penetration by the cutting grains. Result is a more efficient scouring action.

Equipment Varies—Strip scouring equipment may include one to five scouring heads aligned in tandem, occupying an area three to five feet wide and four to twenty feet long, depending on the number and width of the heads. On each head, abrasive material unwinds from a supply roll, is snubbed around a pressure roll then automatically rewound on a waste roll for disposal. With an identical set of rolls located beneath the strip, both sides can be scoured simultaneously. Scouring may be either dry, with water or oil.

Abrasive moves at a constant speed variable from three to 24 inches per minute. The strip moves faster, 50 to 500 fpm. Scouring action results from the faster movement.

Abrasives are 50 to 150-yard rolls in widths up to 50 inches. Abrasive is applied in grits of either aluminum oxide or silicon carbide. Paper must have sufficient tensile strength to carry these abrasives.

Except for oil or water lubricant, abrasives are the only supply ma-

terial for strip securing. Estimated cost for scouring 18-gage 24-inch wide steel strip at 200 fpm would be 30 cents to $1 per ton. Labor costs are minimal since only two men are needed whether scouring line includes two or five heads.

Scouring Applications — Annealing or tempering oxides on tempered and drawn high carbon strip, and surface stains and imperfections resulting from quenching are scoured with grits 80 through 150. For finer finishes, grits up to 320 may be used.

On stainless strip conditioned for bright rolling, scouring is done by silicon carbide paper in grits from 220 to 500, with a slow abrasive feed which burnishes steel, giving it a dark chrome color. This type of scouring removes open metal areas, superficial pits and slivers, cloudy white residue, and exposes the parent metal to the bright rolls.

Scouring supplies long scratch line overlaid with high luster needed for saw and trowel steel. It also generates commercial finishes on stainless strip. Abrasive varys according to condition of the strip surface and the final requirements of the surface finish.

Still to be applied to regular production, experiments with coated metals such as galvanized steel and terne plate show interesting results. Scouring process exposes parent metal of uniform finish which permits subsequent coating to be the same throughout the strip. Uniformly abraded scratch helps amalgamate coatings with metal, providing a high ratio of adhesion. High adhesion, helps metals deformed by dies, to maintain their coat. Eliminated is the possibility of hydrogen or other gases forming beneath the coating which in high temperatures pops off as gas expands.

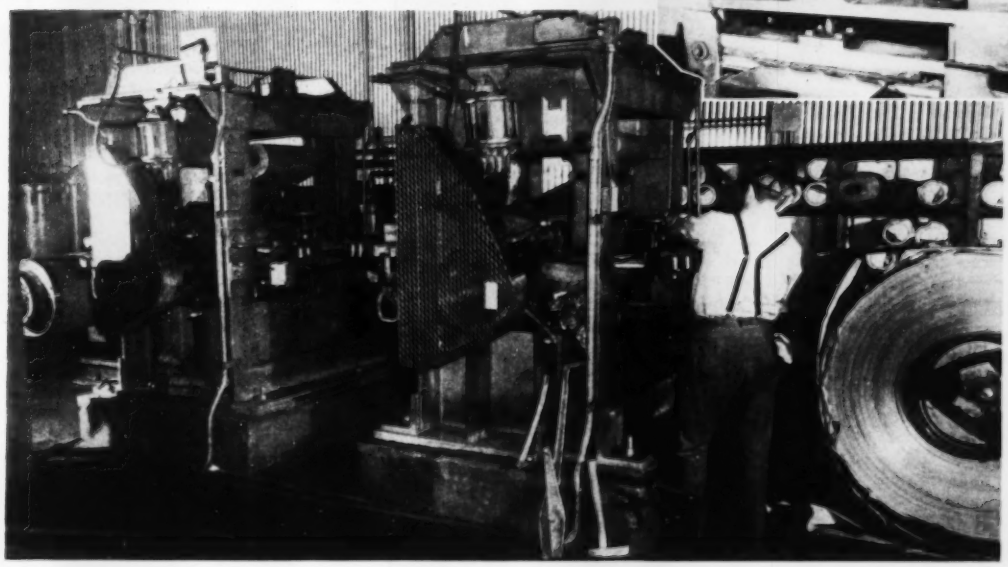
One of the earliest jobs for strip scouring was scale removal from silica steel used for electrical purposes. Strip scouring was substituted for pickling to overcome pitting from chemical cleaning which made its surface unsatisfactory for electrical applications.

If tight black chrome oxides form in annealing operations on stainless and resist acid attack, scouring will penetrate allowing the acids to act.

Strip scouring demonstrated its value for one mill on the first day it was used. Tight oxide had formed in the anneal on 25,000 pounds of stainless and had resisted three trips through hot acid. Instead of sending strip back for remelt, it was given one trip through a two-head scouring unit. Result was pickled strip. Savings paid for the cost of the scouring unit in its first day of operation.

Right—Closeup of strip scouring head. Abrasive material is being rewound on takeup roll. Strip speed is 50 to 500 fpm, abrasive speed is only 3 to 24 ipm

Below—Two head strip scouring installation at Roemer Works of Sharon Steel Corp., Farrell, Pa. Strip is taken up on tension reel at left in the photo



Nine Stacks Operate on Elevated Top Pressure

Eastern States meeting told six Soviet blast furnaces converted to high pressure blowing show 20 per cent increase in output, 11 per cent decrease in coke requirements and 22 per cent decrease in flue dust make

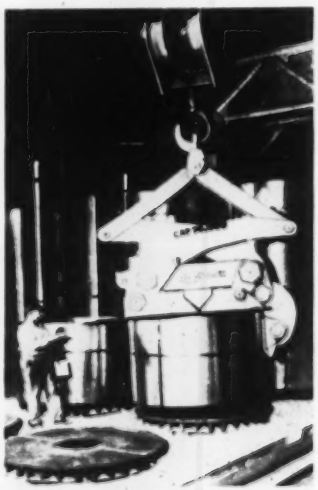
BLAST furnaces in this country now equipped for high top pressure operation total nine with two being made ready for early operation. This was announced by John R. Barnes, superintendent blast furnaces, Republic Steel Corp., Cleveland, at the annual winter meeting of the Eastern States Blast Furnace and Coke Oven Association, Hotel William Penn, Pittsburgh, Feb. 15. Mr. Barnes' paper, in which he reviews high top pressure operation, is presented on p. 89.

Observations by various blast furnacemen engaged in high top pressure operation were highly constructive. Uniform movement of stock in the stack is shown by the perfect circle cut on the wind chart each day, pig iron output increased because of more wind, lost time is normal, flue dust production is lower, coke rate less, iron runs a steady analysis, and the flushes are faster than with a regular furnace.

Pioneer Operates Seven—Republic now has seven blast furnaces on elevated top pressure practice; another is being made ready at the Cleveland plant as well as one at the Great Lakes Steel Corp., Detroit. The Youngstown Sheet & Tube Co. is using high top pressures on one stack. The United States Steel Co. has one stack so equipped but is not employing high pressure operation. One furnace in Great Britain has been converted to elevated pressure operation and six in the Soviet Union. The most recent information on the Russian operation, translated from an article in the Journal of Metallurgy and Foundry Technique (East Zone of Germany), vol. 1, 1951, No. 12, page 383, is as follows:

"At the beginning of this year, engineers of the Stalin Metallurgical Combine in Magnitogorsk, converted the sixth blast furnace for high pressure operation. These are the first that have been done in the Soviet Union. For over a year, the experts, Stalin prize holders, Schatilin and Perewersew and Katschenko, have shown the practical advantages of the new technology. The average production increase from the same shaft volume was 20 per cent; coke consumption per ton of iron and dust loss was decreased by 11 and 22 per cent respectively.

"In a letter to J. W. Stalin, the Magnitogorstk blast furnace workers gave their word that they would convert two further furnaces during the current year. In June, under the direction of the chief engineer of the Combine, the Stalin prize holder, Borissov, the fifth blast furnace was modernized. On June 29 at 6:45 p.m., Ssasonenko, the Foreman's Brigade, blew in the new furnace which is today in full operation. The team of friends, Ssasonenko, Poluchin and Mudanow have taken over the sixth furnace to further develop the experiences of the collective."



GENTLE TOUCH: Coil handling tongs grab and carry 70,000 pounds of strip without damaging edges. Automatic mechanism is controlled by the craneman, without need for a ground crew. Tongs were designed by Heppenstall Co. and operate at U.S. Steel Co.'s Gary, Ind., sheet and tin mill

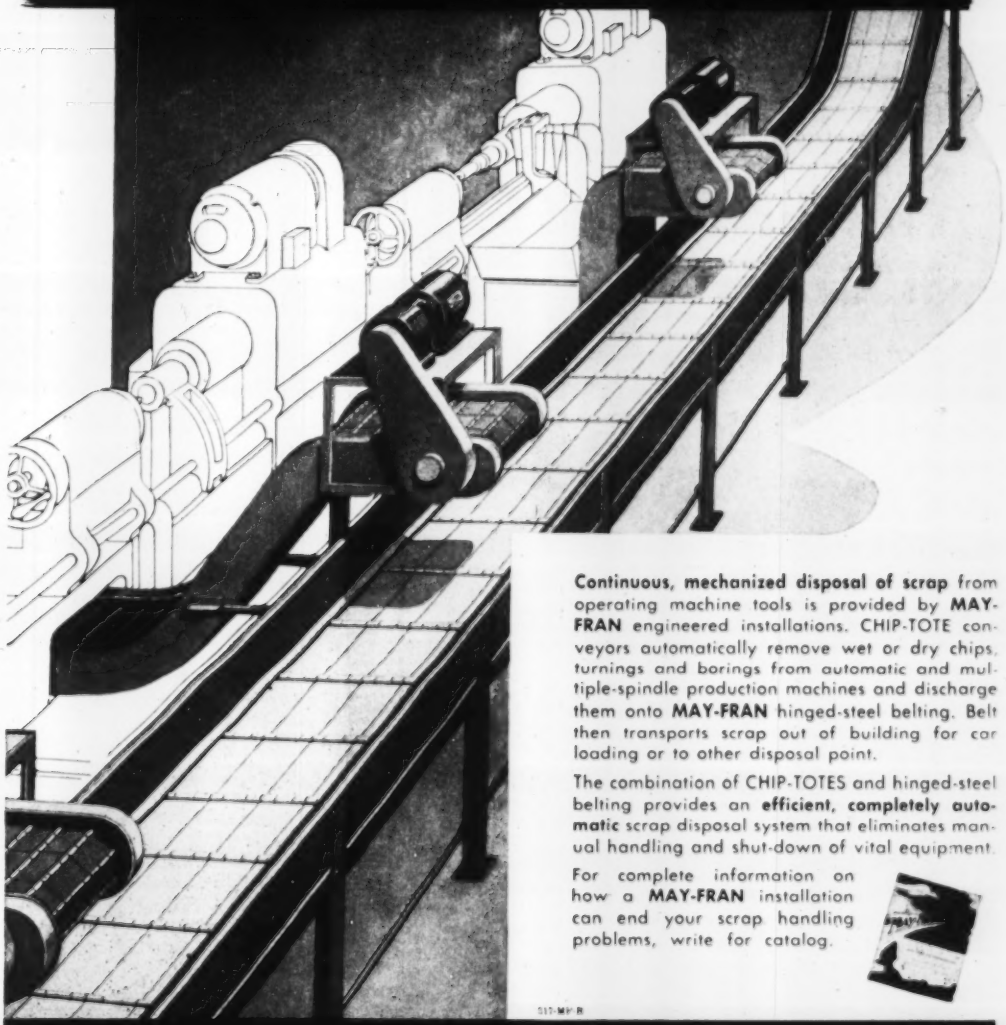
Regardless of how good an industrial relations program may be, a company cannot benefit thereby unless the supervisors carry the program to the employee. This warning was sounded at the opening session by Otis Walker, manager, Industrial Relations, Steel Division, Ford Motor Co., Dearborn, Mich.

Some companies believe that industrial relations are something of a luxury but that is not so, the speaker declared. We could not operate our plant without such a program. A complete and modern program is one thing but making it work is another; and it becomes the responsibility of management and supervisors to make it work. The fundamental human wants of an employee such as security, opportunity and recognition, must always be in the foreground for it means good morale, and good morale means a satisfied employee, good workmanship, and good American enterprises.

Cites Numerous Uses—Successful applications of super-refractories, such as silica carbide, aluminum oxide were described by F. C. Roe, who as co-author with H. S. Schroeder, the Carborundum Co., presented a paper on "Abrasion Resistant Refractory Materials As Applied to Blast Furnace Operations." He mentioned silica carbon linings in dust collectors and wind boxes of sintering machines as giving eight times better service than regular linings. This type of super-refractory is also showing long life in downcomer pipes, elbows and tees, dry collector lining, coke wharf, sintering plant discharge chute, and housings for exhaust fans.

One operator in the Pittsburgh district cited the advantage of manganese plates in downcomers pointing out that the service life is exceeding eight years. He recommended that downcomer design should be changed as higher blast volume is blown.

MECHANIZED SCRAP HANDLING SPEEDS PRODUCTION



Continuous, mechanized disposal of scrap from operating machine tools is provided by **MAY-FRAN** engineered installations. CHIP-TOTE conveyors automatically remove wet or dry chips, turnings and borings from automatic and multiple-spindle production machines and discharge them onto **MAY-FRAN** hinged-steel belting. Belt then transports scrap out of building for car loading or to other disposal point.

The combination of CHIP-TOTES and hinged-steel belting provides an **efficient, completely automatic** scrap disposal system that eliminates manual handling and shut-down of vital equipment.

For complete information on how a **MAY-FRAN** installation can end your scrap handling problems, write for catalog.

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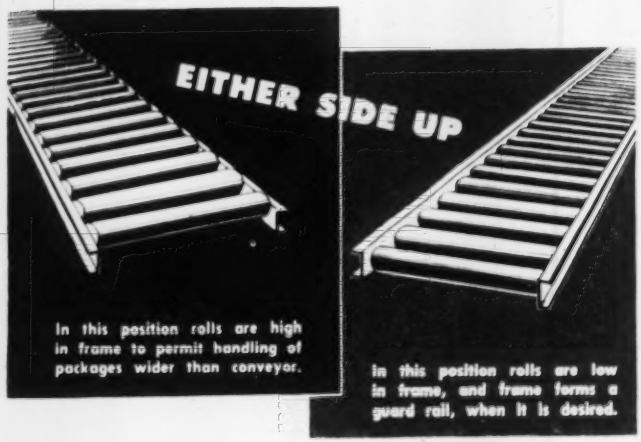
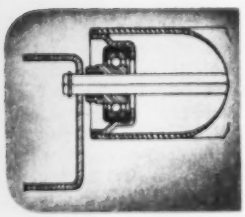

EITHER SIDE UP
In this position rolls are high in frame to permit handling of packages wider than conveyor.
In this position rolls are low in frame, and frame forms a guard rail, when it is desired.

A PRACTICAL FEATURE OF *Logan*
STOCK ROLLER CONVEYOR

Above is shown one of the practical features of Logan Stock Roller Conveyor. Other features include (a) immediate shipment (b) available in several sizes (c) both straight and curved sections can be furnished (d) both stationary and portable supports available. Write for literature.



DETAIL OF ROLLER

FEATURES

ROLLER—2¼" O.D. No. 16 Ga. Welded Steel Tubing, flanged Steel cup secured to tubing. Cap. 150 lbs.

SHAFT—7/16" Hexagon Cold Rolled Steel. Positively held against rotation by hexagon holes in frame.

BEARING—No. 50. Slip fit in cup, easily removed and replaced. Protected position—set back from end of roll.

FRAME—3½"x 1¼"x 10 Ga. Pressed Steel Channel. With four 1-5/16" O.D. 13 Ga. Welded Tubing ties per 10'-0" section. Capacity 75 lbs. per foot with supports on 10'-0" centers and 380 lbs. per foot with supports on 5'-0" centers.

COUPLING—Furnished with bolted type for stationary service. Can furnish hook type for portable service if preferred.

Write or Phone Your Requirements

ALSO Stock WHEEL CONVEYORS

In both straight and curved sections. Ideal for portable use. Light-to-medium duty. Write for details.

Logan Conveyors
LOGAN CO., 535 CABEL ST., LOUISVILLE, KY.

Design Cures Blower Surge

Blowers operating below designed capacity can surge and set up a disturbing pulsation. Overheating and consequent damage result. The initial pressure drop occurs at the blower itself. Pressure in the system then causes air in the line to reverse its direction and flow back into the blower until both pressures become equalized. When this happens the blower resumes its normal function of pumping air into the system until restriction at the line outlet reduces throughput and causes the sequence to repeat. This repetition is the surging.

Frequency and intensity of surging depend on: Design of blower, rate at which air is being removed from the system, and volume of the pipe system to which the blower is delivering air. The same principles apply whether the centrifugal unit is operating as a blower or an exhauster.

Wisest action to take in the prevention of pulsation is to include this factor in the design and installation of the blower, says O. W. Acheson, Billmyre Blower Division, Lamson Corp., Syracuse, N. Y.

Pulsation in a finished installation can be corrected in any one of four ways: 1. Replace the blower with one rated at the proper volume level, 2. add a smaller unit for the turndown periods, 3. permit the blower to operate at rated levels and bleed the excess output away at some point past the blower, and 4. have the blower altered in design to permit bypassing of the excess output.

Furnace Preheats, Dewaxes

Complete 40-foot double-end furnace, installed by Michigan Steel Castings Co.'s Precision Castings Division, Whitehall, Mich., will be used for preheating and dewaxing molds by the lost wax process. Five progressive zones, each with automatic temperature, insure maximum dimensional stability through controlled expansion of the investment mold.

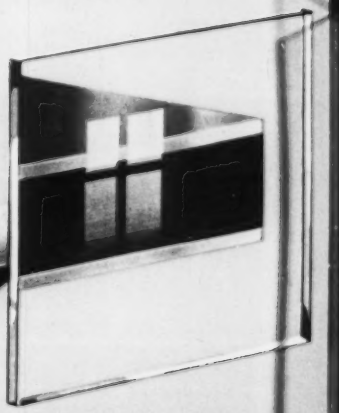
Manufactured by Surface Combustion Corp., the five-section furnace had to be delivered from the Toledo plant in two parts, then joined at Whitehall.

Put

SuVeneer®

CLAD METAL

to work for you



on these and other strategic applications

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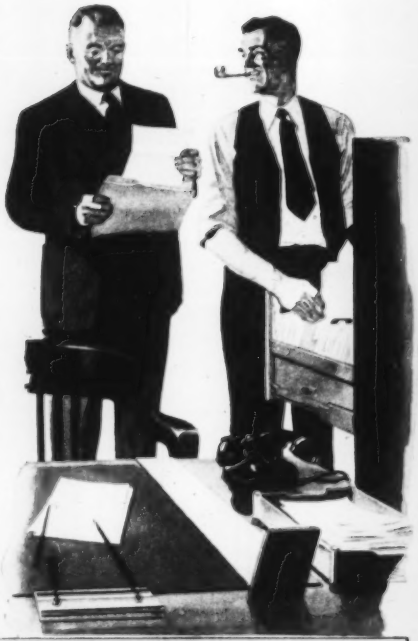
How to cut forging costs



ONE GOOD WAY to make *more* forgings at *less* cost is to line your furnaces with B&W Insulating Firebrick.

For example, A. FINKL & SONS—a leading manufacturer of heavy forgings and a pioneer user of B&W Insulating Firebrick—has made appreciable fuel savings with these lightweight brick. What's more, this company found that B&W Insulating Firebrick have given up to 4 years life in their forging furnaces.

The table below shows five other typical records of B&W IFB savings.

COST SAVING DATA ON DROP FORGE FURNACES LINED WITH B&W INSULATING FIREBRICK

Furnace	Type of Forge	Type of Furnace	Controls	B.T.U./lb. Steel		Reduction in cost of Producing Forgings
				Ordinary Firebrick Lining	Insulating Firebrick Lining	
A*	Upset	Slot	Full	4960	1570	$2.27/ton
B	Steam Hammer	Slot	Air–Fuel	6500	3760	$2.16/ton
C	Drop Hammer	Slot	Full	4000	2400	$1.28/ton
D	Steam Hammer	Slot	None	3180	1620	$1.24/ton
E	Steam Hammer	Slot	Full	3500	1400	$1.52/ton

*All furnaces except "A" spring mounted.

Since durable B&W Insulating Firebrick store and conduct less heat, they also assure better temperature and quality control. By reducing cycle time, they make possible higher furnace output. All these advantages are due to B&W's three decades of specialized refractories engineering.

The defense plant expansion program has created unprecedented demands for B&W Insulating Firebrick. It is, therefore, necessary to anticipate your requirements as far in advance as possible.

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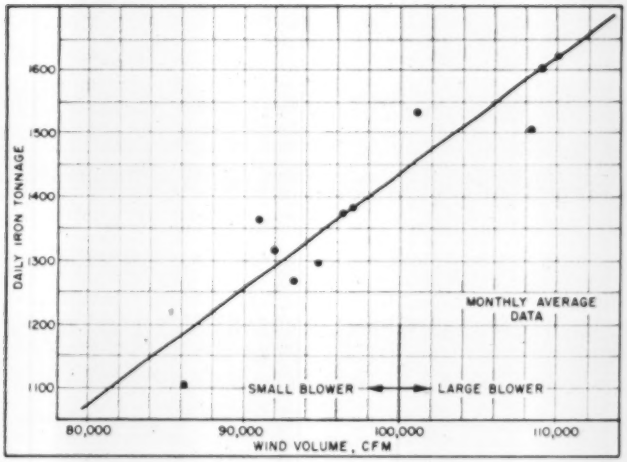


Fig. 1—Effect of wind blown on iron production rate for 1951, Republic Steel's No. 5 stack at Cleveland

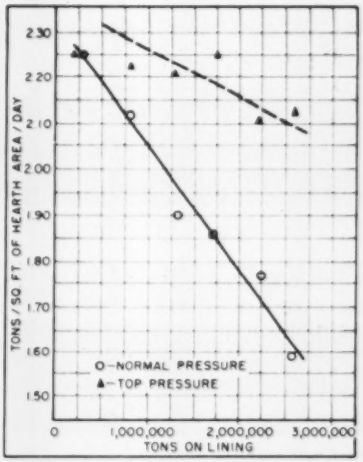


Fig. 2—Data covering a 5-year operation of elevated top pressure furnaces with 22-foot diameter hearths

High Top Pressures for Smoother Furnace Operation

Production of iron from elevated pressure blast furnaces declines 8 per cent after 2 million tons on the lining compared to a drop in output of 20 per cent from normal practice

By JOHN R. BARNES
Superintendent Blast Furnaces
Republic Steel Corp.
Cleveland

IN 1942, under the impetus of the war emergency, T. L. Joseph, professor of metallurgy, University of Minnesota, Minneapolis, urged the National Research Council to sponsor a trial top pressure run on an iron blast furnace. This proposal was tried on a new 27-foot diameter hearth furnace, and the theory of operating under elevated top pressures was proved practical.

Mechanical changes necessary to operate under elevated top pressures have been thoroughly covered in several papers[1]. A turboblower of sufficient capacity to deliver the air blast at pressures of 35 to 40 psi is the basic requirement and the largest single item of expense. Along with the capacity to blow these increased volumes and pressures, sufficient stove heating capacity and structural strength must be insured. Structural strength capable of withstanding the increased pressure is also necessary on the furnace proper, dustcatcher, gas washer and connecting piping. All furnace water cooling members are keyed in as a safety precaution.

Constant Water Level—Sufficient water pump delivery head must be available to overcome the increased pressure. The gas washer water level is maintained by an automatically-operated butterfly in the discharge pipe of the washer. In addition there is usually an emergency dump valve operated by a float in a stilling chamber. A counterweighted valve is generally used on the bottom of the washer as an added safety precaution.

The septum or pressure controlling valve consists of three butterflies. Two of these are manually preset while the third is operated automatically. There are also from one to three bypass openings in the septum valve. This unit is located after the gas washer allowing it to operate in primary cleaned gas.

Gas under pressure must be introduced between the bells to enable the large bell to operate. This gas is supplied by an equalizing line from the top of the gas washer. This same line is extended upward to the furnace bleeder platform and capped with a bleeder valve actuated by a dirty gas impulse. A pressure relief line must be provided in order for the small bell to dump. An impulse line with pressure gage is run from the gas seal to the stockhouse for the benefit of the skip operators. In the most recent installations a mercoid switch, actuated by this same impulse line, is electrically interlocked into the charging sequence.

Furnace bleeders are of the pressure-closing type, pulled open by air or steam cylinders. One counterweighted bleeder is installed on the furnace top as a safety valve. This valve and seat are hard surfaced, and the valve is weighted to open at several pounds above the setting of the power bleeders.

Bell and Hopper Erosion—Erosion of the large bell and hopper

is the result of poor seating of the large bell due to particles of stock clinging to the bell surface and establishing a leak. The erosive action of the high-pressure gas leaking through soon cuts the surface of the bell, hopper or both, thus creating a permanent leak.

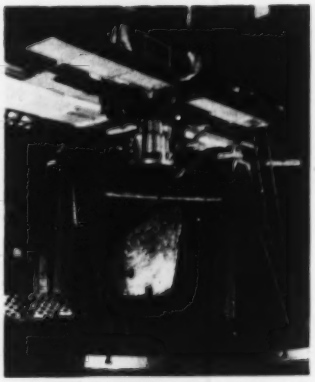
Hard surfacing of the seating surfaces has been tried with spotty success, some plants reporting increased bell life while others still encountered erosion trouble. Hard surfacing has not stopped erosion but rather retards it. This condition is somewhat dependent upon the type of charge materials available for use in the various plants.

Line contact seating of the large bell has been tried as a means of getting better bell seating. This was accomplished by the use of a large bell with an angle of 53 degrees and a hopper with an angle of 50 degrees. At present it is felt that this angle differential is too great. The latest design to be tried is a modification of line contact seating with a 53 degree angle large bell and hopper and a seating surface 1 to 4 inches wide with the hopper then cut away to a 51½ degree angle below the seating surface.

In one instance, even though the bell had started to leak, several years additional service from this bell at 10 pounds top pressure have been obtained through the adoption of the practice of equalizing the pressure between the bells after each small bell dump. This greatly reduces the time for possible erosive action. Hard surfacing is not being applied to bells or hoppers at present.

Flue Dust and Coke Rates—One of the outstanding advantages of elevated top pressure operation of a blast furnace is the decrease in flue dust produced per ton of pig iron. This is brought about by the increased pressure causing the volume of the top gas, and thus its linear velocity, to be reduced. Because of this, flue dust production is seldom a determining factor in the amount of wind that can be blown.

Operators have this means of making high rates of production; however, because of the increased wind blown, and other factors shown by Liggett[2], coke savings may not be realized. In the cases where increased wind volumes have been blown, the CO/CO_2 ratio has increased along with a slight reduction in the amount of blast heat available.



BOTTOMS UP: Size of this Kaplan-type runner vane made vertical machining necessary. Here Allis Chalmers does the job with a 30-foot boring mill, placing a center on the table and tail stock on the mill rail. Vane is for one of the two 55,000-hp turbines going to TVA's Pickwick Landing plant

Through the use of elevated top pressures, it is economically feasible to blow wind rates well over 100,000 cfm. In this past year a new 5-stage turboblower was installed at Republic's Cleveland No. 5 furnace. This blower is rated at 125,000 cfm at 35 psi and 2900 rpm. No. 5 furnace broke the corporation tonnage record three months in succession using this blower in conjunction with an average top pressure of 11.4 psi.

The final record was made with a burden consisting of 78 per cent ore and 21 per cent sinter. Wind was blown at the rate of 110,089 cfm at a top pressure of 11.3 psi. Monthly iron production was 50,215 net tons with a 1678-pound coke rate and a 113-pound dust rate per ton of iron. No scrap was charged during this period.

Fig. 1 shows the effect of wind blown on the iron production rate of the Cleveland No. 5 furnace for the year 1951. Data used are the monthly average and includes the period from the reline in December, 1950, to date. The curve shows the marked increase in production that has been possible since the installation of the new turboblower which has permitted wind volumes much in excess of those previously obtainable with the small turboblower. This curve clearly illustrates that iron tonnage is a function of wind blown, and that with pressure operation, since it is possible to blow at much higher wind rates, substantial increases in iron production result.

Output Is Increased—In Youngstown, No. 1 furnace recently converted for top pressure has been making bessemer iron. A comparison of averages for the five months preceding and five months following the conversion to top pressure shows an increase in production with an increase in wind blown of 27 per cent and a reduction in flue dust of 63 per cent.

In Cleveland, a 25-foot 6-inch hearth furnace with a volume of 39,625 cubic feet was rebuilt and converted for top pressure operation in November, 1951. We are successfully blowing 90,000 to 95,000 cfm with a good dust rate on this furnace. Production has been substantially increased.

Data have been collected (Fig. 2) over the past five years, on Republic furnaces with a hearth diameter of 22 feet and over, and plotted as net tons/square foot of hearth area/day versus tons on lining for both normal and top pressure furnaces. The curves show that as lining age increases, the top pressure furnaces continue to produce at much higher rates than the normal top pressure furnaces at comparable lining ages. Specifically, the output of the pressure furnaces only falls off 8 per cent after 2 million tons have been produced on the lining while in the case of the normal furnaces the drop off in production rate is over 20 per cent.

If production is not of prime importance, the use of elevated top pressures in conjunction with moderate wind volumes offers a means of an added control to effect coke and flue dust savings and at the same time do this with much smoother operating characteristics of the furnace than is possible under normal top pressure.

Republic Sets Pace—Republic Steel Corp. now has seven furnaces operating under elevated top

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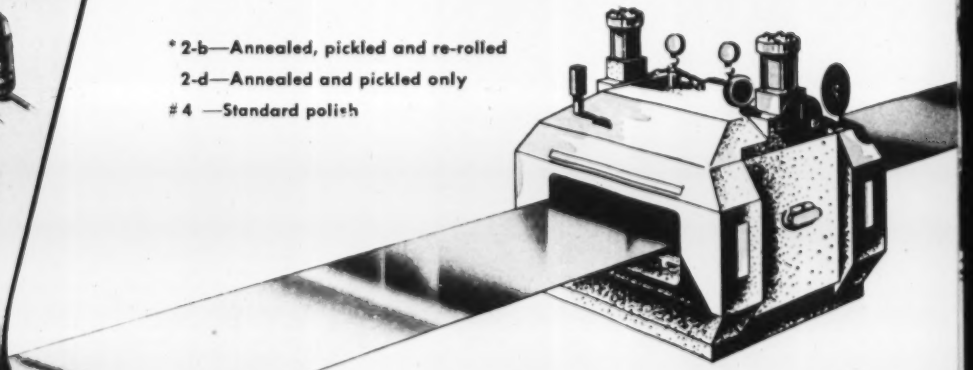

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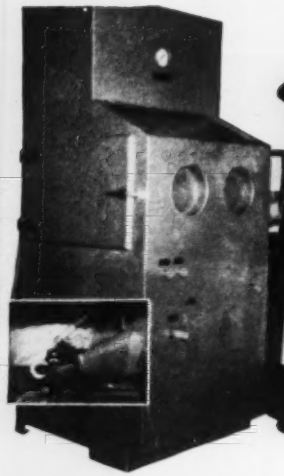

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While the model illustrated is manually-operated, PRESSURE-BLAST models are available with rotary barrels for handling small pieces in bulk; roller tables for accommodating heavy molds and dies; indexing or constant-speed rotary tables and conveyorized models for high production rates. We will engineer a PRESSURE-BLAST to meet any production or engineering requirements.

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pressure and another, a twin to Cleveland No. 5 about to be blown in. This represents approximately one half of Republic's iron production. Two of these furnaces are far past their expected lining life. The operators believe they are still producing iron because of the smoothness of operation made possible by elevated top pressure. Two others have been relined and are well on their way into their second elevated top pressure campaign. The materials are now on hand to convert one more furnace to top pressure operation in the near future.

To those of us who have worked with elevated top pressure from the beginning, it is especially gratifying to note that two furnaces in other corporations in this country and another in Britain have been equipped to operate at elevated top pressures. Several more are in the process of construction.

Early in 1951,[3] engineers of the Stalin Metallurgical Combine in Magnitogorsg, converted the sixth blast furnace for high-pressure operation. These are the first that have been done in the Soviet Union. For over one year, these experts have shown the practical advantages of the new technology. The average production increase from the same shaft volume was 20 per cent; coke consumption per ton of iron and dust loss was decreased by 11 and 22 per cent respectively. At this time, these same workers pledged to J. W. Stalin that they would convert two further furnaces during 1951.

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2 "Pressure Operation of Blast Furnaces—1950," by R. P. Liggett, Chicago Regional Technical Meeting, American Iron and Steel Institute, Dec. 1, 1950.

3 "A New Blast Furnace Technology," Journal of Metallurgy and Foundry Technique (East Zone of Germany), vol. 1, 1951, No. 12, page 383.

A paper presented at the annual winter meeting, Eastern States Blast Furnace and Coke Oven Association, William Penn Hotel, Pittsburgh, Feb. 15.

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Technical story of low-frequency induction heating is explained in a booklet by the Magnethermic Corp. Cartoon illustrated, the booklet describes the principle of induction

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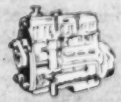
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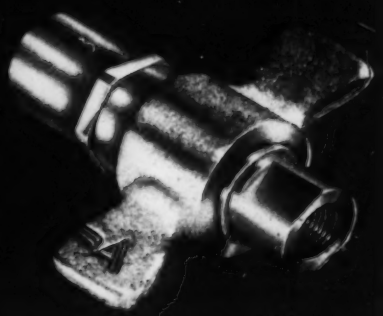

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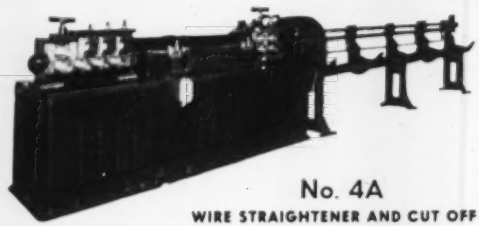

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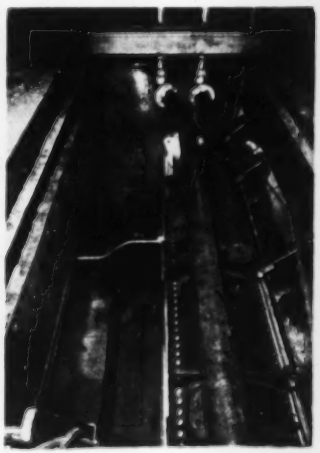
Copper Creep Studies Expand

Investigation at National Bureau of Standards of creep of high-purity copper extends to cold-drawn copper. In an earlier phase of the same program, the bureau studied creep characteristics of oxygen-free high-conductivity copper in the annealed condition. Present work utilized samples of the same lot, as cold-drawn to 40 per cent reduction in area. Specimens were tested for creep characteristics at 110, 250 and 300° F with constant loads in tension.

Results showed shape of extension-time curves for cold-drawn copper were similar to that observed for annealed copper, high-purity aluminum and ingot iron. Deformation in the second stage of creep was discontinuous; degree of discontinuity was affected by test temperature and stress. No simple or consistent relation was found between ductility of cold-drawn copper and time required to attain either the third stage of creep or complete fracture. Curves showing relation between stress and



COAL SAVER: Britain's first atomic heating plant warms all 80 offices of the Atomic Research Center at Harwell. Constant hot water flow results from this heat exchanger placed in outlet air duct of the atomic pile's cooling system. Estimates place savings at approximately $6500 per year

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second-stage creep rate, for both annealed and cold-drawn conditions, were not linear when experimental results were plotted either on log-log or semi-log coordinates.

At each test temperature, cold-drawn copper was markedly superior to annealed in creep and fracture resistance. This superiority in strength was accompanied by considerable loss in elongation at fracture. For equivalent second-stage creep rates and temperatures, reduction of area at fracture was about the same for both forms of copper.

Metallographic study of the specimens after testing in creep confirmed previous finding that several modes of deformation occur during the creep tests. For similar test conditions, the number and size of the sub-crystals observed in the region of fracture were decreased by cold-drawing the copper prior to testing in creep. Furthermore, cold drawing the copper appeared to alter the condition under which transcrystalline and intercrystalline fractures occur.

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Most corrosion engineers are unaware that neoprene is produced in a form that makes it useful for maintenance work. The synthetic rubber, known for its applications as sheet lining for chemical tanks or brush coating for pump and valve interiors, is now used profitably on exteriors of tanks, process equipment, structurals and pipelines. So says L. S. Bake, E. I. du Pont de Nemours & Co. Inc., in a report to the St. Louis section, National Association of Corrosion Engineers.

Mr. Bake reports the new material is not intended for direct immersion in corrosive chemicals, like the older linings. Rather it offers protection against splash, spill, corrosive fumes and atmospheres.

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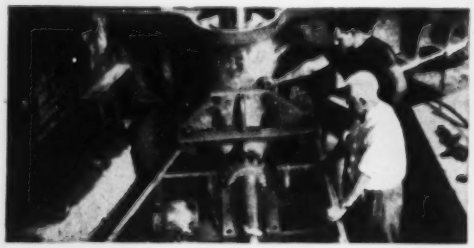

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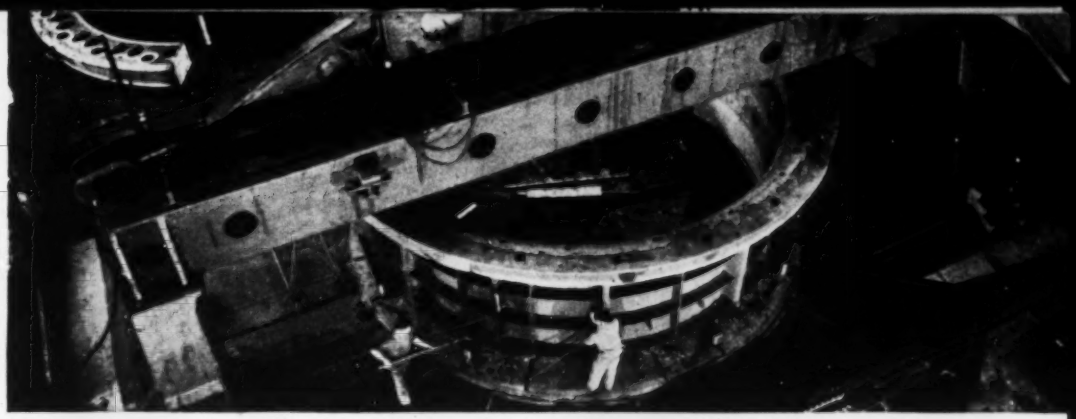
This reel contains free-cutting brass, aluminum, cold-rolled and stainless steel, phosphor, and hardware bronze. All except the stainless steel were machined on B&S Automatics using Sunicut 11, which does not corrode the bronze gibs, minimizes carry-off. Another Sunicut grade is used on the stainless steel.



$400,000 vertical boring mill, one of the world's largest, bores, turns and faces hydraulic turbine parts. Sunoco Way Lubricant, approved by 38 machine tool builders, was selected by the design engineers to prevent stick-slip with resultant scoring of ways and slides. Even under the weight of work as heavy as 75 tons, Sunoco Way Lubricant has never squeezed out.

METALWORKING LUBRICANTS

SUNVIS 900 OILS—Unexcelled for hydraulic systems, spindles, and gear boxes of machine tools where longest possible oil life, plus maximum protection, is required. Sunvis 900 Oils have a high viscosity index and uniform 0 F pour point, are fortified to prevent corrosion and oxidation.

SUNVIS OILS—For general lubrication of machine tools at normal temperatures. Ideal for application through oil cups, fittings and holes. Have high uniform viscosity index, low pour point, and low carbon content.

SUNVIS H.D. 700 OILS—Unsurpassed for hydraulic systems and gear boxes where continuous contamination and rusting are problems. Recommended as hydraulic system cleaners. Supply detergency, and minimize oxidation and corrosion.

CIRCO OILS—Straight mineral oils designed for once-through application by bottle-oilers, wick-feed oilers, oil holes, etc., on machine tools.

SUNTAC OILS—Recommended for bearings, gears, sprockets, chains, cables, couplings and linkages to eliminate "throw-off." Compounded to provide adhesiveness. Suntac Oils cling to bearing surfaces and supply constant, superior lubrication.

SUNOCO WAY LUBRICANT—Eliminates "stick-slip" of tables, scoring of machine tool ways, poor finishes. Non-corrosive, with outstanding metal-wetting and adhesive properties, ample viscosity, and E.P. qualities.

SUN GUN GREASES—Smooth greases with excellent pumpability. Designed for pressure fittings on equipment operating at normal speeds and temperatures.

SUN ADHESIVE PRESSURE GREASES—For chains, slides, cams, sprockets, open gears, cables, couplings, linkages, etc., where "throw-off" must be avoided. Applied without preheating.

SUN ROLLER BEARING GREASES—For use in electric motors and ball or roller bearings on machine tools.

SUNEP OIL—Lead-naphthenate type of extreme-pressure lubricant for heavy-duty gears, bearings and other heavy-duty applications. Excellent stability, as well as rust-preventive and noncorrosive characteristics, helps prolong life of gear sets.

CUTTING OILS

SUNOCO EMULSIFYING CUTTING OIL—Mixes with water to produce a stable white emulsion. Efficient and economical cooling and lubricating medium for turning, milling, drilling and other metalworking operations on ferrous and nonferrous metals. Also an excellent grinding coolant.

SUN HEAVY-DUTY EMULSIFYING CUTTING OIL "F"—Developed for applications where neither regular emulsifying oils nor straight cutting oils are completely satisfactory. Can frequently replace straight oils, especially on high-speed jobs, where it eliminates smoking.

SUNICUT 11—A low-viscosity, transparent, straight cutting oil that will not stain brass or copper under normal conditions. An excellent dual-purpose oil, it is intended mainly for Brown & Sharpe automatics machining all nonferrous metals, as well as free-machining steels such as B1112 and B1113.

SUNICUT 102—A transparent, active-sulfur-type, straight cutting oil recommended for automatic screw machines on all types of steel. An ideal general-purpose cutting oil in shops using a wide variety of machines.

SUNICUT 105—Heavy-duty, transparent, sulfurized, straight cutting oil for operations like gear-cutting and broaching. Also for turret lathes and hand screw machines doing turning, threading and tapping on alloy steels.

SUNICUT 209—A medium-viscosity, transparent, straight cutting oil for machining all grades of steel, also brass and copper. Especially good as a dual-purpose oil on larger automatics. Recommended for more difficult screw machine jobs—such as alloy steels and tough bronzes demanding high finishes and close tolerances.

In this pipe fitting plant, S.E.C.O. replaced a straight cutting oil and eliminated the need for costly alkali cleaners and rust preventives. Beside doing an efficient cutting job, it keeps fittings from rusting or discoloring, and has eliminated slippery floors.

SUNICUT 216—A special oil developed for thread-grinding operations. Heavily compounded to produce mirror-like finishes and eliminate burning and checking.

SUNICUT 812W—Low-viscosity, transparent, straight oil, containing additives which prolong tool life, produce a better finish. For use as a dual-purpose oil for automatic screw machines and as a general-purpose, medium-duty cutting oil for nearly all machine tools.

SUNICUT 817W—Similar to Sunicut 812W except that it has a higher viscosity. Retains its excellent cutting and lubricating qualities even under the severe conditions for which it is intended . . . heavier cuts and higher temperatures.

SUNICUT 973—Low-viscosity, transparent, straight cutting oil gives superior finishes and excellent tool life when machining aluminum or magnesium and their alloys. Won't stain steel, aluminum, magnesium or copper. Its cooling and lubricating qualities make high-speed production possible.

ADDITIONAL METALWORKING PRODUCTS

SUN QUENCHING OILS—Oils specially refined to aid maximum development of desired physical properties in a wide variety of steels.

SUN TEMPERING OILS—Particularly suited to tempering steel. Because of their low carbon content and long stability under heat, these oils have an unusually long service life.

SUN ROLLING OILS—Both straight and emulsifying oils which permit maximum production in rolling steel, aluminum, brass and copper.

SUN SPIRITS—For metal cleaning. Among fastest cleaners of its type. Colorless and free of sulfur compounds. Needs no heating or mixing. Considered safe when used properly for factory processes by the National Board of Fire Underwriters. Flash point over 100 F.

SUN INDUSTRIAL PRODUCTS

SUN OIL COMPANY, PHILADELPHIA 3, PA. • SUN OIL COMPANY, LTD., TORONTO AND MONTREAL

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ENGINEERS

TO DESIGN, REDESIGN OR DEVELOP YOUR PRODUCT

ENGINEERS

TO TOOL AND EQUIP YOUR PLANT FOR THE BEST PRODUCTION ECONOMICS

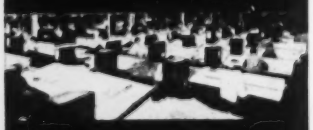
ENGINEERS

TO GET YOUR NEW PRODUCTION GOING AND KEEP IT GOING

&

ENGINEERS

TO REDUCE YOUR COSTS AND IMPROVE YOUR QUALITY



ENGINEERS, DESIGNERS, CONSULTANTS AND PRODUCTION SPECIALISTS

PIONEER ENGINEERING & MANUFACTURING CO., INC.

19662 JOHN R STREET
DETROIT 3, MICHIGAN

INQUIRIES PROMPTLY ANSWERED

rately added accelerator. It dries by solvent evaporation and cures by polymerization of the neoprene.

The speaker lists among its advantages neoprene's excellent resistance to acids, alkalis, oils, most hydrocarbons, and to sunlight and weather. Its resilient qualities are inherent—not the product of plasticizers that may volatize or leach out. Film brushes readily despite solids content of 60-70 per cent and cures at room temeprature ready for service in 24 to 48 hours.

Disadvantages cited emphasize the fact that it is a two-part system. The user must stir a few ounces of accelerator into each gallon of material just before application. After acceleration, pot life lasts about 12 to 36 hours—depending on amount of accelerator used. To insure good adhesion, all surface must be sand blasted or wire brushed thoroughly and a primer coat applied. Colors other than black can be achieved only at the expense of some chemical and abrasion resistance.

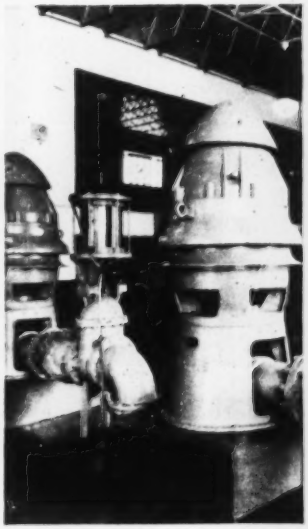
Stampers Schedule Spring Panel

Program for the Pressed Metal Institute's spring technical meeting offers panels on four phases of stamping that should aid operations throughout the industry. The conference is scheduled Mar. 20-21 at Hotel Carter, Cleveland. Thursday discussions cover Tooling for Short Runs and Estimating Factors and Cost Analysis for Intelligent Stamping Quotations. On Friday, members will discuss Practical Quality Control for the Stamping Industry and Technical Knowledge for the Stamping Salesman.

Inspection Service Available

To better furnish job-by-job inspection where it is needed, Magnaflux Corp., Chicago, is increasing the national coverage of its commercial laboratories from 5 to 11 locations. Folders are available to cover the two phases of this inspection: Laboratory inspection of parts and field inspection for large objects.

This inspection service is an addition to the regular manufacture and sale of inspection equipment by the company. Addresses and information about the new inspection



LAYNE PUMPS

for decatur, alabama

Nine Layne river intake and filtered water pumps have been installed to quadruple Decatur, Alabama's city water supply. Four of these short coupled vertical turbine pumps have a combined capacity of 4-million gallons of filtered water daily.

These self priming, space saving pumps are Layne designed and precision built to maintain peak operating efficiency. They are constructed of materials selected for durability and are rugged enough to give excellent service for the years to come.

Like the city of Decatur, a great number of other municipalities, factories, processing plants and chemical works have found Layne pumps to be exactly as described. All are engineered for the job they are to do . . . and all more than fulfill their performance obligations. For further information address

LAYNE & BOWLER, INC.
General Offices, Memphis 8, Tenn.

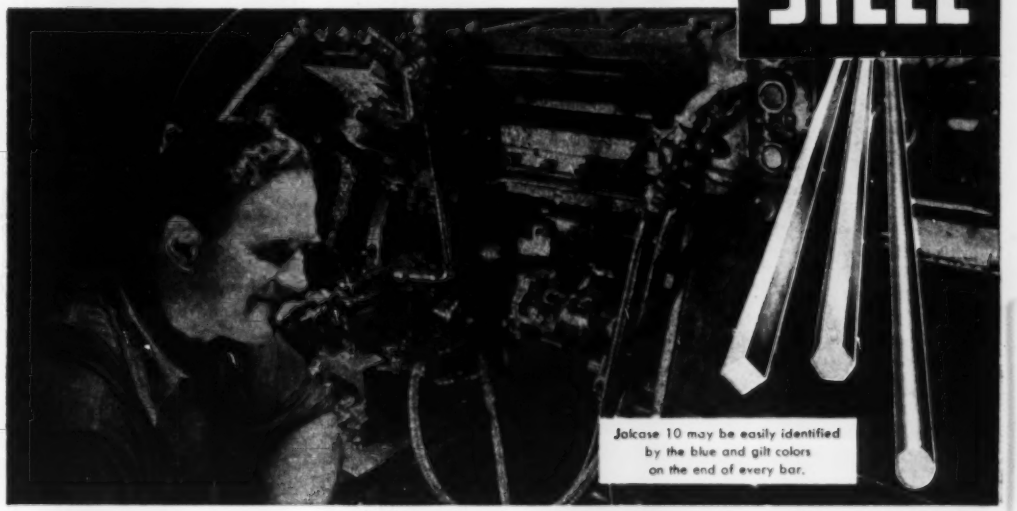
. . . Layne . . .
water wells

VERTICAL TURBINE PUMPS
WATER TREATMENT

JALCASE 10 HELPS YOU

. . . eliminate a production step
. . . machine better cold-finished parts

J&L STEEL



Check these advantages of **JALCASE 10** *that offer you faster, more economical operations . . .*

NO HEAT-TREATING OF FINISHED PARTS REQUIRED

Many times finished part specifications on a job call for a high degree of hardness, but not as high as that obtained through heat-treating the finished part. In these applications, parts manufacturers and machinists have found it profitable to use Jalcase 10 and eliminate heat-treating altogether.

MINIMUM DISTORTION

Although Jalcase 10 is a high-carbon steel, distortion is cut to a minimum through special treatment during the cold-finishing process. As a result, when mechanical properties must be as high as possible and distortion held to a minimum, Jalcase 10 fulfills these rigid requirements.

HIGH MECHANICAL PROPERTIES

Jalcase 10 (A.I.S.I. No. C-1144) has the following cold-finished properties:

Minimum Tensile Strength	115,000 lb/sq. in.
Minimum Yield Strength	100,000 lb/sq. in.
Elongation in 2 inches	7% (minimum)
Reduction of area	20 %(minimum)
Brinell Hardness Range	235—285

PLUS . . . all the other advantages Jalcase steels have over ordinary screw stock:

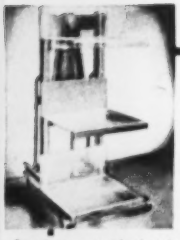
1. lower cost per unit produced
2. finer finish on completed pieces
3. longer machine-tool life
4. less screw-machine down-time

WANT MORE INFORMATION?

Send for our FREE booklet entitled "You Can Make Them Better with Cold-finished Jalcase." This illustrated booklet gives you complete technical information about *all ten* grades of Jalcase and how they can help you get better results in your machining operations. WRITE TODAY!

JONES & LAUGHLIN STEEL CORPORATION

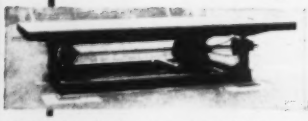
404 JONES & LAUGHLIN BUILDING, PITTSBURGH, PENNSYLVANIA



Portelvator, standard style "S"; capacity, 1000 pounds; lift, 52".

Portelvator, standard style "A"; capacity, 2000 pounds; lift, 15".

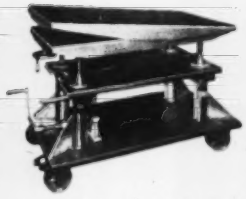
Portelvator, fixed position, basement installation for extra high lift from ground floor.



Portelvator, fixed position, pit installation for positioning truck and trailer beds to loading platform.

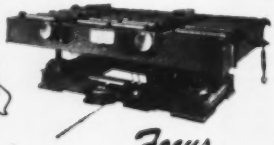
Portelvator, portable, elevating, for the movement and positioning of automobile body dies.

Portelvator, fixed position, automatic, self-leveling, for sheet feeding operation.



Portelvator, portable, elevating, tilt top, to facilitate removal and emplacement of bus motors.

Portelvator, fixed position, pit installation for "below and above floor level" operation; sheet feeding.



Portelvator, fixed position, roller top, elevating, die transfer table; self-loading and self-discharging; capacity, 25 tons.

Focus
on the
MOVEMENT and POSITIONING
of
TOOLS and MATERIALS

The devices shown here are typical of standard and special PORTELVATORS® regularly used by industry to effect the smooth movement and accurate positioning of tools and materials. The record of production economies brought about by the use of such devices is astounding.

Doubtless the application of a similar device will improve your production also. We will be happy to furnish you with details of construction and operation. Ask also for our Bulletin P-502 which gives full particulars about standard Portelvators.

THE Hamilton TOOL COMPANY
848 SO. NINTH STREET • HAMILTON • OHIO • U • S • A

laboratories are shown in the folders. Copies will be sent on request to the company, 5900 Northwest Highway, Chicago 31. This inspection includes consultation on how to solve problems of causes of the defects encountered and how to establish acceptance standards.

Compressor Hits 10,000 cfm

Largest and newest air compressor in Ford Motor Co.'s River Rouge plant develops 10,000 cfm, but is about half the size of older units having substantially smaller output. The two-stage compressor with its 2000-hp electric motor was installed and operating in only 14 days when the company's plant pressure dropped below operating minimum.

To fill Ford's need, the compressor had to fit into limited second floor space 14 feet above grade. Thus, it had to be as free from vibration as was possible to reduce need for a massive foundation. Heavy-duty equipment was necessary, since it was planned for continuous service.

To meet these requirements and still achieve sufficient output, the company installed the balanced-opposed CBA 4 model made by Clark Bros. Co. Inc. Driven at 277 rpm by a type TS General Electric synchronous motor, it is a four-cylinder, 17-inch stroke, two-stage unit. Instead of conventional mounting between frames, the motor is supported integrally on the end of the one-piece forged steel crankshaft. No outboard bearing is needed.

Metal Blasted for Enamel Base

Airless abrasive blasting is being used by sanitary ware manufacturers for cleaning metallic surfaces and producing a matte-type finish for vitreous enameling. One manufacturer is using an airless blast cabinet made by American Wheelabrator & Equipment Corp., Mishawaka, Ind. Continual cleaning production of 120 bathtubs, 960 sinks or 720 washbowls is maintained.

Five rotating wheels centrifugally hurl metallic abrasive at the ware as it is carried through the cabinet on rotating hooks. Rotation of the hooks, suspended from a monorail conveyor, permits ab-

Legs for lethal eagles

Legs for lethal eagles – hydraulic landing gear that cushion Uncle Sam's big bombers as they come down to roost – this is just one of the many uses of OSTUCO Tubing by manufacturers in the progressive aircraft industry. Aircraft designers are specifying OSTUCO Tubing for fuel lines, engine mounts, landing gear, and many other applications because of its inherent strength without weight characteristics and the ease with which it can be machined, formed and fabricated to the most exacting requirements.

But whether your products are aeronautical or of a distinctly different nature, you owe it to your future to investigate the advantages of OSTUCO Tubing for improving quality and reducing cost.

We cannot always promise early delivery estimates on new civilian orders, because of military demands, but it will pay you to consult our experienced engineers about OSTUCO Tubing when redesigning your products to meet future competition.

THE OHIO SEAMLESS TUBE COMPANY
Manufacturers and Fabricators of Seamless and Electric Welded Steel Tubing
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KELVINATOR has standardized on

PLATECOIL

REPLACES PIPE COIL

The Flexseal Melting Tank pictured above is one of many heating processes utilizing Platecoils at the Kelvinator Division, Nash-Kelvinator Corp., Detroit, Michigan. They have found that Platecoils have so many advantages for heat transfer operations that they have standardized on their use in such applications as alodizing tanks, defluxing dip tanks, defluxing washers, parts washers and dip alodizing systems.

- **MORE EFFECTIVE HEATING.** Platecoil's faster heating has resulted in quicker starts for those applications shut down during the night.
- **MORE WORKING CAPACITY.** Platecoils take up less room in the tank than the pipe coils formerly used.
- **STEAM LEAKS REDUCED.** Platecoils have no joints in the solution. Irritating steam leaks have been greatly reduced.
- **SAVES DOWNTIME AND DUMPING OF SOLUTION.** Platecoils are easily removed for maintenance without dumping tank solution as was previously required. All connections are outside the solution. Platecoils are disconnected, lifted out and replaced in a hurry.
- **EASY CLEANING SAVES DESCALING TIME.** There is no comparison in the time it takes to descale the Platecoils used in Phosphatizing solutions and the pipe coils formerly used. The Stainless Steel Platecoils pick up less scale in the first place — and this is quickly removed by brushing. Compare this to the hours of pickling and chipping formerly required.

You, too, can save money by using Platecoils in most any application where pipe coils are now used. Why pay more, when Platecoils will give you more efficient heating at less cost? *Send today for your copy of bulletin No. P72.*

PLATECOIL

KOLD-HOLD MFG. CO.

rasive to reach all areas of the metal to be cleaned and one tub or several sinks can be carried on each hook. The only men needed to attend the cabinet are those for loading and unloading the hooks.

Enamelers say airless blasting with metallic abrasive improves quality control since it removes thin iron layers covering trapped dirt and gas in the castings. Exposure of these imperfections before enameling prevents enamel blisters.

Metal Spray Shows Savings

A manufacturer of printing equipment saves 23,000 pounds of stainless steel in one year on a metallizing application, says Metallizing Engineering Co. Inc., Long Island City, N. Y. Water-rollers made by the company and used in the printing presses of can manufacturers for printing on tin are subject to corrosion. They were formerly made with stainless steel, about 40 pounds going into each roller. With metallizing, mild steel can be used for the base. Stainless steel 0.080 to 0.100-inch thick is sprayed on providing the necessary corrosion protection after preparation by grit blasting and finish grinding. A saving of about 32 pounds of stainless steel per roller is made possible.

Another user saved a 200-pound shaft with 19 pounds of stainless steel. The shaft had worn from its original 5⅛ inches to 4¾ inches over a section about 19 inches long. Spraying 19 pounds of stainless took about 2 hours.

Electrical Tester Described

Industrial electronic surge comparison tester is described in a Westinghouse bulletin. The tester is used mainly to locate insulation faults and winding dissymmetries in various electrical apparatus. Specifications of both the portable and the mobile units are given plus principles and methods of operation.

Diagrams and descriptions of tests connections are also presented. These include the two coil comparison, three phase, and surge induction tests, with recommendations as to where these tests can

"THERE SHE BLOWS"

From one end of the oil country to the other, McKay Chain is at work helping hit pay sands. But then—you'll find McKay Chain everywhere doing the useful jobs of lifting, hauling, rigging, tying, spinning and other material and power transfer applications.

In every industry—there is a McKAY CHAIN FOR EVERY USE . . . no job is too big, none too small!

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Write for the bulletins you need.

McKAY CHAIN

for Every Use

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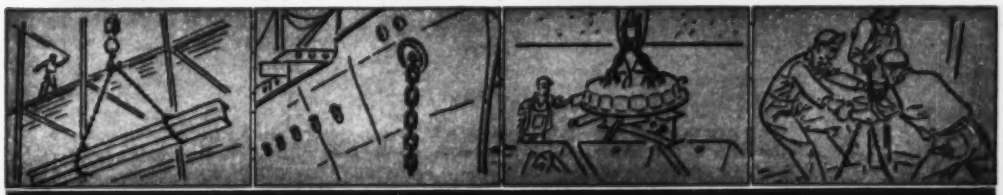


9 DAYS' FABRICATION IN 1/2 DAY

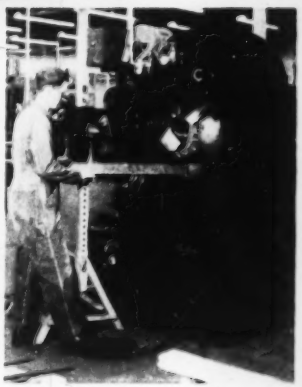
"Buffalo" with this U.I.W.*

With their No. ½ "Buffalo" UNIVERSAL IRON WORKER*, a well-known electrical manufacturer accomplishes in just a half-day fabrication operations which formerly required nine days! Similar astonishing time savings are being effected throughout the metal working industries with these versatile punching - shearing - bar cutting - mitring - coping-notching machines. Top photo shows two operations going on at once: (1) man on left is punching holes in the leg of an angle and (2) man at right is coping an angle.

Right, ANGLE MITRE is just one of many jobs the U. I. W. handles. Just below angle stripper is stripper for round and square bars, always in position. For complete information on the seven models available, write for Bulletin 322-0.

•

Left, the U. I. W. PUNCHING AND SHEARING SIMULTANEOUSLY. Note stripper at shear and holding flat tightly against bottom knife. Easy maintenance is assured by centralized oiling system.



"Buffalo" MACHINE TOOLS

BUFFALO FORGE COMPANY

158 MORTIMER STREET BUFFALO, NEW YORK

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

DRILLING PUNCHING SHEARING CUTTING BENDING

best be used. High frequency testing with a high voltage, high frequency, high power tester is also described. Copies of this bulletin, DB 85-960, will be sent on request to Westinghouse Electric Corp., Box 2099, Pittsburgh 30.

Royalty Free Patents Available

Descriptions of 23 patents owned by the U. S. Government and held by the Atomic Energy Commission have been transmitted to the U. S. Patent Office for registry and listing in the official register of patents. The commission will grant nonexclusive, royalty-free licenses on the listed patents, as part of its program to make nonsecret technological information available to industry. Commission-held patents and patent applications released for licensing now total 395.

Applicants for licenses should apply to the Chief, Patent Branch, Office of the General Counsel, U. S. Atomic Energy Commission, Washington 25, identifying the subject matter by patent number and title. Copies of the patents may be obtained from the U. S. Patent Office.

Magazine Shows Wire Stitching

Information on materials handling and wire stitching techniques highlights the latest issue of Acme Steel Co.'s quarterly magazine, Confab. Article on metal stitching as a means of production assembly illustrates step-by-step formation of different types of stitches. Work on materials handling includes a case history describing application of the palletless pallet load. Publication will be circulated free upon request to the company's Dept. 2G, 2840 Archer Ave., Chicago 8.

Chemists View New Lab Tools

Exhibit of analytical laboratory and spectrographic equipment shown by 35 exhibitors will be seen this week at the Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy. The conference opens Wednesday and continues through Friday at the William Penn Hotel in Pittsburgh. As a feature of this year's plans, employees may find needed personnel among persons registered

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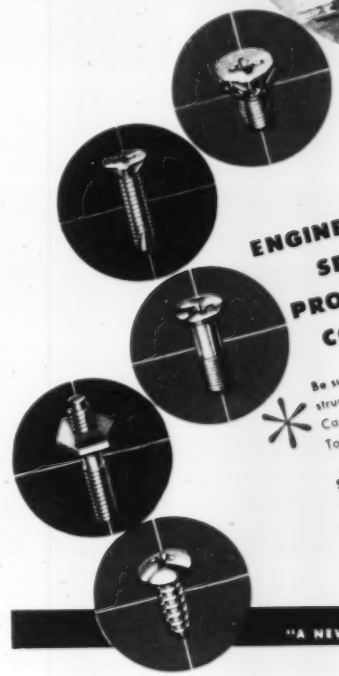
SPECIAL TOOLING SKILLS
PRODUCTION FACILITIES
CONTINUOUS INVENTORY



* Be sure you get the maximum in close tolerances, structural design and prompt high-volume supply. Camcar guarantees this quality through Special Tooling Methods and Selective Machine Control.

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"PRODUCTION-DESIGNED FOR YOUR ASSEMBLY LINE"

If you are a victim of the machine tool situation, you'll find that Electro *Specific Purpose* Grinding Wheels in your older machines, will largely offset obsolescence.

The heart of any grinding machine is the wheel; and super-efficient wheels can help you get by until the machine tool situation eases.

The technicians in our chemical and engineering laboratories will, if necessary, originate special wheels to meet your requirements.

They have complete latitude as to kinds of abrasives and types of bonds. We'd like to apply this total freedom in materials and methods for gains to you in quality of output, saving in time and lower costs.

May we, at our risk, send a Field Engineer to consult with you within the next few days?

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SPECIFIC PURPOSE
GRINDING WHEELS
for
CUTTING OFF
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PRECISION GRINDING
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MANUAL 645 AND SPEED CALCULATOR FREE ON REQUEST

Electro SPECIFIC PURPOSE GRINDING WHEELS

as candidates for positions at an employment bureau to be operated during the program.

Transistor Lightens Signal Pack

Important advance in developing small, light military communications equipment was accomplished by replacing vacuum tubes with transistors. Installed by Army Signal Corps, the transistor was used in an experimental miniature converter with radio teletypewriter equipment to change radio impulses to the kind of current required for actuating a teleprinter. It needs only about one one-hundredth part of the current required for equipment now in use.

Transistorized converter weights 10 pounds. This is compared with about 100 pounds for present comparable units. Estimated transistor life, if the converter is operated 24 hours a day, is about seven years. Vacuum tube life, reports the Signal Corps, is much shorter.

Developed by Bell Telephone Laboratories in 1948, the transistor is a germanium crystal that amplifies any alternating current, including radio waves. It performs many functions of the vacuum tube, but requires no power for heating filaments—thus causing substantial current saving. Power is supplied by ordinary 1½-w dry cell batteries; heavy generators in mobile units today supply 175 w for converters. In addition, transistors are solids, providing greater shock and vibration resistance.

Lubricant Meeting Announced

Lubricants and their manufacture will be the subject of a conference to be held in Cleveland Apr. 3, 4 and 5 sponsored jointly by Case Institute of Technology and the Cleveland section of American Society of Lubrication Engineers. Titled "A Short Course in Fundamentals of Lubricating Materials," the conference will cover problems of manufacture, selection, specification and application of lubrication oils, greases and surfaces.

Conference will discuss the manufacture of lubricants and show what can be done with them. Dr. Thomas J. Walsh of the department of chemistry and chemical engineering at Case, director

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of the conference, says it is also expected to point the way to the future in focusing attention on what's expected in the next few years in lubrication.

Lectures, discussions, and question periods are included in the program. Oils, greases, synthetic and solid lubricants will be discussed. Conference fee is set at $35.

Jet Blades Will Be Fabricated

Fabrication of jet engine stator blades is announced by General Electric Co. Developed by the company's Thompson Laboratory, Lynn, Mass. the process involves fabrication of the stationary blades of jet compressors in place of the relatively slow and expensive forging technique currently used.

According to C. W. LaPierre, manager of the aircraft gas turbine division, the process not only will speed up production but promises savings in critical materials and dollars. Also pressure will be relieved on the nation's forging facilities. He estimated cost reductions of 55 per cent and says a 39 per cent savings in critical materials could be achieved. General Electric is making the process available, through the Air Force, to other turbojet manufacturers.

The compressor is the many-bladed device which forces air in great quantities to the combustion chambers. It consists of a rotor and a stator. The rotor is cylindrical and has hundreds of blades affixed to its outer surface. Surrounding the rotor is the stator, which has hundreds of stationary blades. The stainless steel blades on both rotor and stator are precision manufactured with air foils similar to the air foil of the wing of an airplane. Current J-47 models, for instance, have about 2000 compressor blades, more than half being on the stator. The fabrication process has been approved for the stationary blades, while the rotary blades will continue for the present to be forged because of the high centrifugal stresses involved.

Under the precision forging process, the blade and its base are hammered from a single piece of stainless steel. The air foil is formed during the hammering process. The base is dove-tailed so as to fit into

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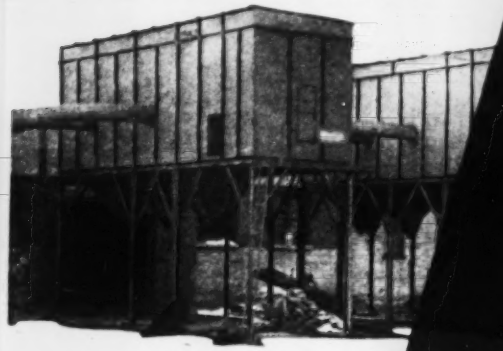

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Results of this installation are very satisfactory. No dust escapes into the atmosphere, working conditions are excellent and this area of the foundry is exceptionally clean—in spite of the dusty nature of this operation. Two other Dustubes are used in the foundry to ventilate other operations.

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D3081

a blade ring and the rings holding the more than 1000 stationary blades are pushed into slots in the compressor casing. Under the fabrication process the blades are rolled in long strips, contoured to the proper air foil, and then simply cut to the desired length during assembly. The base, welded to the blade is so shaped as to eliminate the need for the blade ring.

Tool Study Announced

Studies will be made by the Research Division, New York University College of Engineering covering proper cutting angles, feeds and speeds for new tool bit materials. Dr. Harold K. Work, director of the research division, says the project will be under the supervision of Fred H. Posser, assistant professor of mechanical engineering and supervisor of the gage laboratory. The contract was awarded by American Electro Metal Corp., Yonkers, N. Y.

Booklet Illustrates Blending

Illustrated description of blending is offered in a booklet published by Robins Engineers Division, Hewitt-Robins Inc. The company defines principles, covers mixing, proportioning and evaluation, then compares bin blending with operations done by its own equip-

COEFFICIENT COMPUTOR: Timesaving value of digital computors makes them adaptable to research at Battelle Memorial Institute, Columbus, O. Operating in the new mathematical laboratory, they are useful in design and quality control work and determining aerodynamic coefficients

ment. Concluding chapters treat blending for blast furnace, copper smelter, for raw material conservation and blending for general industry. To obtain copies write to the division, 157 Chambers St., New York 7.

Light Falls on Defense Controls

Continuing its efforts to clarify operation under government controls, Machinery & Allied Products Institute is sponsoring four regional defense controls conferences during March. First of this type meeting was held Nov. 30–Dec. 1 at the Mayflower Hotel, Washington. At this session, the institute programmed discussions on production controls and CMP; special amortization; economic stabilization; wage, salary and price controls; renegotiation; government contracts; and fiscal and credit controls.

MAPI is arranging for similar coverage by top controls' agency officials at the conferences this month. Schedule begins Mar. 19 at Hotel Statler, Boston; then Mar. 20, Waldorf-Astoria, New York; Mar. 26, Hotel Statler, Cleveland; and Mar. 27, Hotel Conrad Hilton, Chicago.

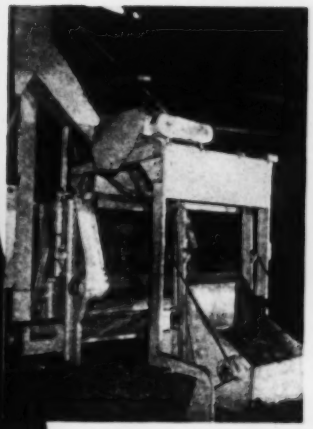
American Lava at Half Century

Story of the custom manufacture of technical ceramics is told in pictures and diagrams by American Lava Corp. in a 48-page booklet published in observance of its 50th anniversary. Representative group of products tailored for specific industrial applications, plus a flow chart to aid in following continuity of process pictures, concludes the publication. Requests for copies on company letter head should go to the manufacturer, Chattanooga 5, Tenn.

Process Facilities Grow

New Process D-Enameling Corp., Aurora, Ill., put into operation an additional sandblast line designed for processing bathtubs, sinks and other large parts. The line consists of an overhead conveyor unit and a sandblast room housing two additional operators per shift. Installation of this line not only increases the capacity of the plant but re-

a machine that's just your size



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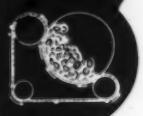

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duces the amount of handling necessary in the processing of large cumbersome parts.

Belt Loading Studied

Excessive wear on conveyor belts can be checked by good design and proper loading

INCREASED service life and decreased maintenance cost are dividends resulting from proper care of belting used on conveyor installations. Thermoid Co., Trenton, N. J., completed a study of factors causing excessive wear. Under the direction of Newell Perry, belting engineer, the study singled out loading conditions as a prime factor in belting deterioration.

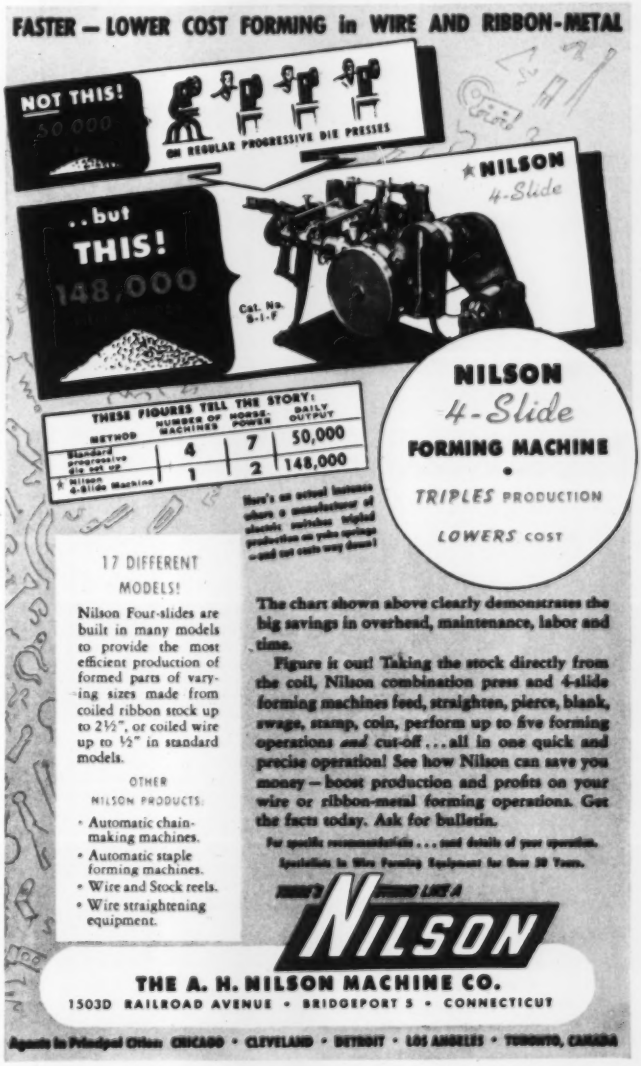
The loading point is a danger zone. Both existing and proposed installations should be regarded with the intention of creating ideal loading conditions. One of the basic requirements for low-rate belt wear is to see that material loads the belt while moving in the same direction and at the same speed as the belt. Where this requirement has not been satisfied, installations have shown excessive belt wear due to abrasion created at the loading point.

Cushioning Helps—When lumpy material is being carried, an attempt should be made to have such material cushioned by a prelaid layer of fines. A screen at the bottom of the loading chute or an oval or fishtail notch cut in the lip of the chute will satisfactorily deposit a layer of fines over the belting, thus providing protection against bruising.

Velocity of loading-material flow should be controlled by pitching the loading chute properly. If this is not feasible, a baffle of iron or wooden bars should be constructed in the chute to reduce the speed of material flow onto the belt. However, the minimum rate of this flow should be sufficient to maintain delivery of the desired volume. Falling distance between chute and belting should also be minimized to prevent excessive speed of material-flow which in the case of lumpy material might be great enough to cause belt damage. Material should never strike the belt directly above a solid pulley because the resulting hammer-anvil action will quickly destroy the belting. The chute should be located so material will strike the belt between idlers. In cases where heavy material is being loaded it may be necessary to load directly over rubber-covered or pneumatic idlers.

Skirt-Boards—In some cases impact of the load between idlers will set up belt vibration. Resultant chattering may depress the belt enough to allow material to escape under the skirt-boards. This may be prevented by locating the chute so loading material will strike the belt far enough ahead of the tail pulley to allow insertion of at least one belt-steadying carrier pulley. Also, carrier pulleys should be more closely spaced around the loading zone because of impact loading of belt at that point.

Construction of loading chute skirt-boards and flexible skirts should be carefully considered. Skirt-boards should be long enough to settle the material before it leaves the loading area. Flexible skirts are preferably improvised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from rubber-covered edges of belting remnant. These remnants should be placed so the rubber-covered edge contacts the belting. Should this be reversed, and the exposed-fabric edge of belt remnant placed against the moving belt, grit will collect in the fabric. Resultant abrasive action of the flexible skirt will wear a track through the belt cover.

Vertical spacing between chute skirt boards and belt increases toward the open end of the chute. Thus the width of flexible skirts, as cut from a belt remnant, should increase toward one end. This construction allows uniform contact between the flexible skirt and belt over the entire length of the chute skirt and minimizes spillage around the loading point. At the same time, wedged-in lumps of material can be worked free by the forward motion of belting.

Book Shows Band Tool Work

The "Band Tool Manual," 160 pages of comprehensive explanation of band tools used in sawing, slicing, filing, grinding and polishing is offered by DoAll Co., Des Plaines, Ill. Photographs and drawings are used throughout to define band tool terminology and clarify machining applications. Conventional low-speed machining, friction sawing, line grinding, band filing and cutting vitreous materials with diamond tooth blades are a few of the applications illustrated.

Series of 82 selection charts is arranged alphabetically according to type of material. Charts give recommended band machining factors for optimum cutting rate, tool life and finish. They cover selection of tool, its speed, pitch, feed, coolant and other related factors to be employed for efficient operation. Copies of the manual sell for $2 and are available from the company's sales offices.

Electrical Data Book Revised

Revised edition of the engineers' and architects' electrical data book is available from Westinghouse Electric Corp., Pittsburgh. The 330-page issue includes information on new equipment, methods

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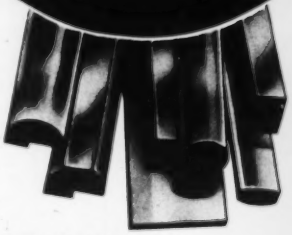

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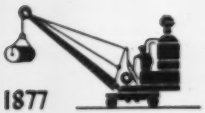
1877



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Today, Industrial Brownhoist Diesel Electric Locomotive Cranes perform double duty as switch engine or crane. They work equally well with magnet, hook or bucket.

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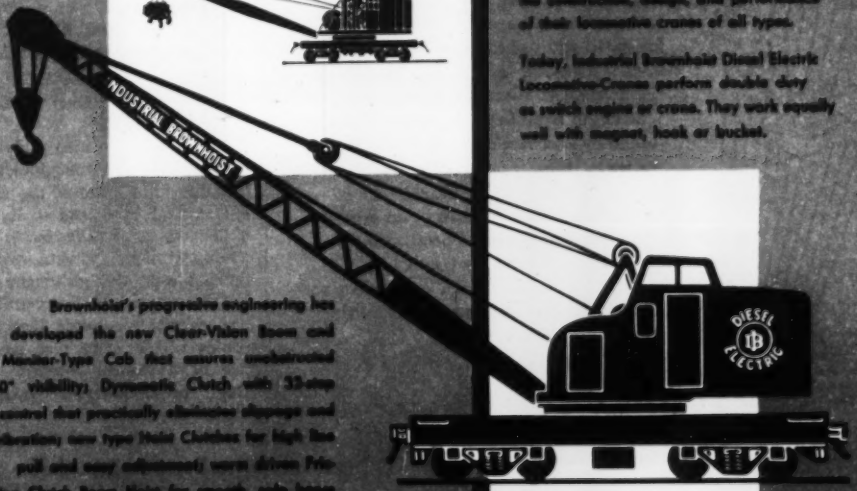

Brownhoist's progressive engineering has developed the new Clear-Vision Boom and Monitor-Type Cab that assures unobstructed 360° visibility; Dynamatic Clutch with 32-step control that practically eliminates slippage and vibration; new type Hoist Clutches for high line pull and easy adjustment; worm driven Friction Clutch Boom Hoist for smooth, safe boom operation. Optional features on Brownhoist cranes today include Dual Controls, 8-Wheel Chain Drive for increased drawbar pull, Twin Engine Drive for greater traction and Timken Roller Bearing Journals. Brownhoist Diesel-Electric Locomotive Cranes are available in capacities from 30 to 90 tons.

1952

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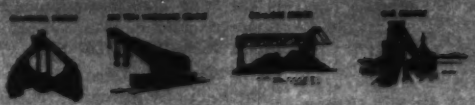

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184

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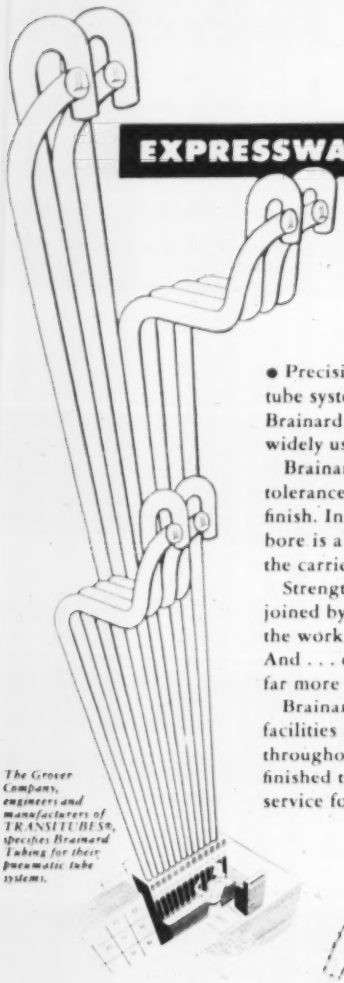

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and an entire section on power distribution.

Topics are considered under three general equipment categories: Power plant; electrical distribution and utilization; and accessory equipment. All apparatus is described with illustrations, charts and data, including applications and specifications. Engineering data section deals primarily with design of distributions systems. Copies are available from the company's district offices.

Reports Probe Foundry's Future

Reports that summarize efforts toward increased productivity in the foundry industry are reviewed in the February Technical Reports Newsletter. Material covers an improved metalcasting process, said to be faster and cheaper; offers a bibliography of suitable motion pictures and film strips to show foundrymen improved working methods; and surveys U. S. productivity in the brass and gray iron foundry fields.

The Newsletter also reviews two research reports that indicate increasing knowledge of the element silicon that may lead to its availability in a ductile metal form. Technical developments are cited on flash welding high tensile steels; heat pumps; building ventilation; and ultra-thin ceramic films. Single copies will be sent free from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C.

Iron Powders Described

Physical properties of its product, Carbonyl iron powders, are described in a booklet offered by Antara Chemicals Division, General Dyestuff Corp. Containing a minimum of text, it contains photomicrographs, charts, graphs, tables and pertinent mathematical formulas, complete with an extensive bibliography. Six types of powders are discussed, ranging in average size from 3 to 290 microns in diameter, and in iron content from 98.1 to 99.9 per cent pure.

Widest use of the powders is in the field of electronics. The purity and magnetic properties of the powders, their stability, and resist-

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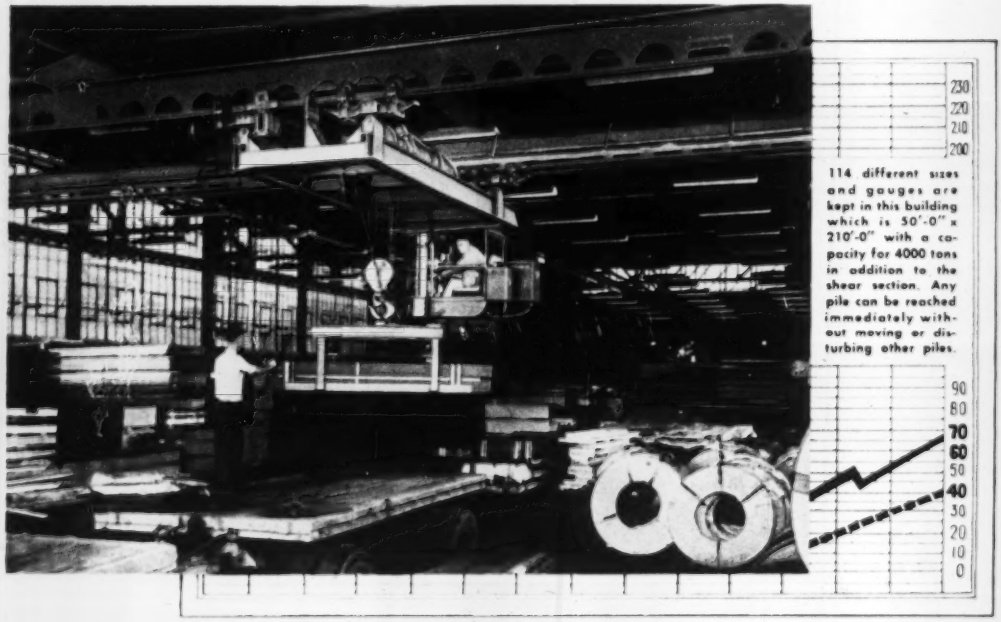
The magazine of the men who manage, operate and buy for the metalworking industry . . .

STEEL • Penton Building • Cleveland 13, Ohio

A PENTON PUBLICATION

Crane Cuts Steel Handling Costs 66⅔%

Boosts Shear Production 40%



Up to 15 truck loads, or 150 tons of incoming steel are handled in a day by a 5 ton, 48'-0" span, 3 runway Cleveland Tramrail crane in the warehouse of the Art Metal Construction Co., Jamestown, N. Y., well-known manufacturers of office furniture. This formerly was lifted off the trucks with a chain hoist onto floor trucks which handled it thereon.

The new Tramrail Crane takes the steel directly from trucks to storage without re-handling, and, also, from storage to shears. One man in the crane cab and another on the floor take care of the entire steel handling job. The man-hours required for this have been cut to one-third.

An extra advantage, not originally anticipated, has been the increased output of the six shears. Formerly, it was necessary for the shear operators to haul the steel they cut, from storage to their machines. Now this is done by the crane. As a result, the shears are in operation more of the time and shear production has been increased 40%.

Properly engineered overhead Tramrail equipment can be such an important factor in lowering costs and securing other advantages that we urge you to have a nearby Cleveland Tramrail representative check your handling methods.

GET THIS BOOK!

BOOKLET No. 2008 Packed with valuable information. Profusely illustrated. Write for free copy.

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
7871 East 284th St. Wickliffe, Ohio

CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

ance to shock make them attractive for high-frequency cores to increase Q value, vary inductance, and reduce size of coils. In core-making the particles are insulated before molding. This insulation, coupled with small particle size, aids eddy current reduction.

Powder metallurgists will be interested in readiness of the powders to sinter and in the compression qualities. Magnetic clutches and brakes, and medicine are other fields of Carbonyl powder application. Copies of the booklet are available on request to the company, Dept. 99, 435 Hudson St., New York 14.

Power Tool Care Hints Given

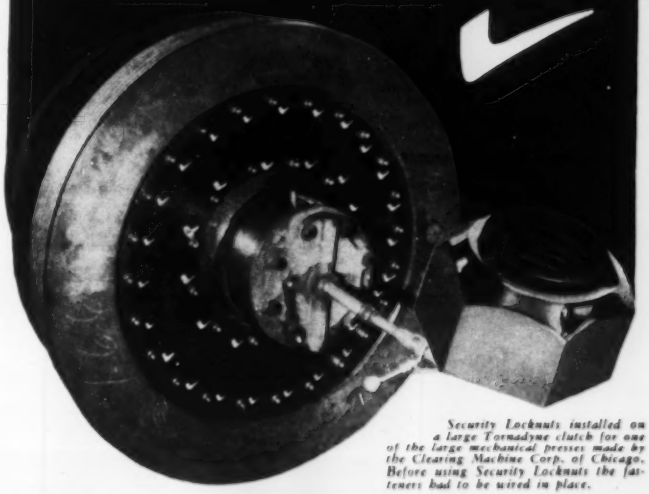
Practical information on maintenance and care of high-cycle tools is offered in "Keep 'Em Working", a booklet from Rotor Tool Co., Cleveland. Suggestions on inspection, lubrication and general operator care are discussed. Reasons for overheating of the 180 and 360 cycle motors are given and other general trouble-shooting ideas are suggested.

Actual repair information is also presented. Care of the motor, cable, and power supply is shown in the light that such care prevents many actual breakdowns. In the back of the booklet are rules for safety in operation. Listed as bulletin No. 39, the illustrated pamphlet will be sent on request to the company at 17325 Euclid Ave. Cleveland.

Lead Wire Error Preventable

Errors caused by temperature changes in lead wires of resistance wire strain gages are readily preventable, Baldwin-Lima-Hamilton Corp., Philadelphia, points out. Self-compensating gages eliminate the necessity for dummy gages to compensate for temperature changes but render circuits susceptible to error from temperature changes in lead wires unless precautions are taken. Simplest correction is to use lead wires of very low electrical resistance or of a coefficient such as constantan or manganin. However, if copper wire is used it may require too large a size for convenience, or the dead resistance of a low coefficient

CHALLENGE US!



Security Locknuts installed on a Large Tornadyne clutch for one of the large mechanical presses made by the Clearing Machine Corp. of Chicago. Before using Security Locknuts the fasteners had to be wired in place.

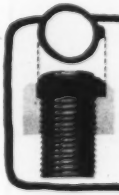
WHAT is your fastener problem? Are you wiring nuts in place? Are you paying the extra cost of installing cotter pins? Are you peening the ends of bolts and making removal or repair difficult?

Challenge us to solve that fastener problem! We are doing it for others and can do it for you.

We would like to have you see the results of tests that have proved the Security Locknut practically vibration proof. A Security Locknut holds and stays "put" even in the face of vibration that destroys the bolt. Security Locknuts can be adjusted and re-adjusted any number of times but more important, they can be removed and re-used over and over again without materially losing their locking power and without damage to the bolt.

If you have a vibration or fastener problem accept our challenge. Ask for a sample Security Locknut. Send the coupon. No obligation, of course.

SECURITY LOCKNUT CORPORATION
North Ave. and 15th Ave., Melrose Park, Ill.



This picture shows a cross-section of a Security Locknut. The insert, indicated removed, is of high quality, heat treated, alloy spring steel and becomes a permanent part of the nut.

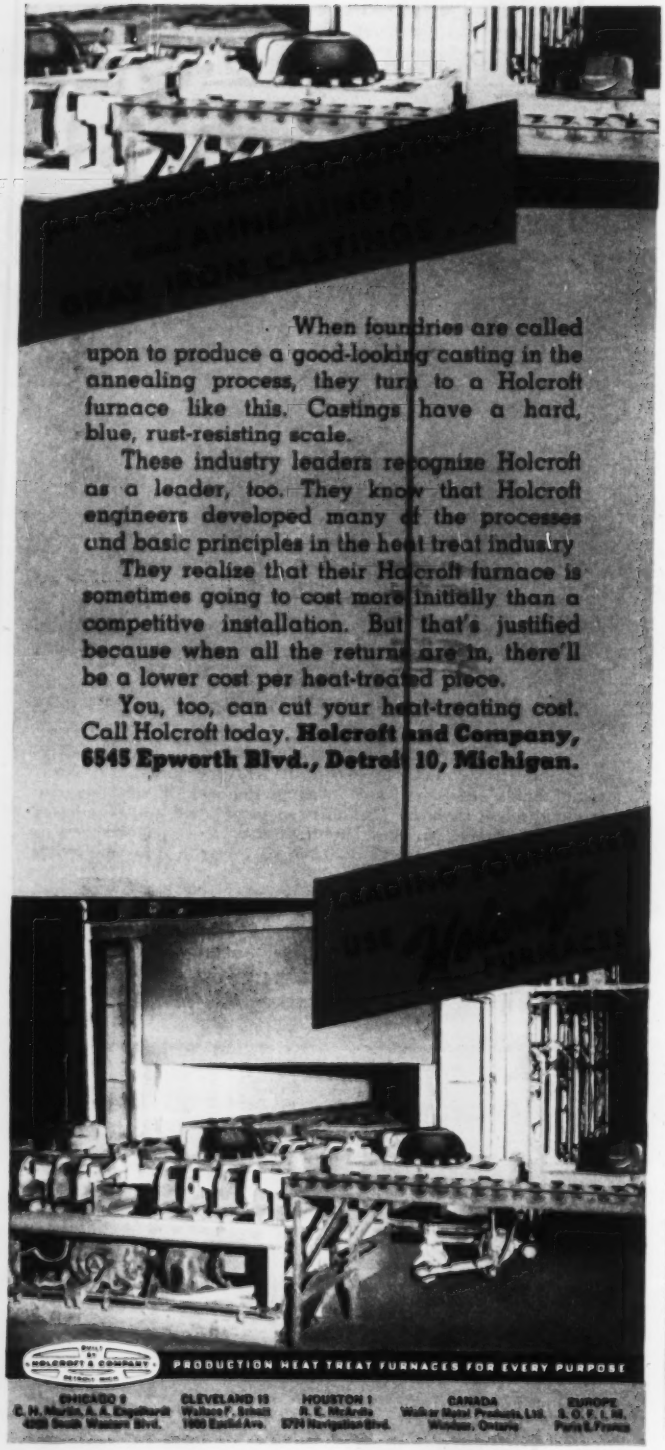
The insert is elliptical in shape and this design causes the retainer to grip the bolt with the terrific tension that only spring steel of great strength could exert and prevent the nut from turning. Simple—dependable—positive.

SPECIAL OFFER!

Here's an easy way to arrive at thread tolerance figures. Ask for a Security Thread Tolerance Chart. Just spin the dial and you have the figure you need. Send the coupon. It's yours for the asking.

SECURITY LOCKNUT CORPORATION
North Ave. and 15th Ave., Melrose Park, Ill.
Please send me without obligation:
☐ One of your Thread Tolerance Charts.
☐ We have a fastener problem and would like to know more about Security Locknuts.
Company Name _____
Address _____
Town _____ Zone ____ State _____
Signed _____

Security
The Nut You Can't Shake Loose


When foundries are called upon to produce a good-looking casting in the annealing process, they turn to a Holcroft furnace like this. Castings have a hard, blue, rust-resisting scale.
These industry leaders recognize Holcroft as a leader, too. They know that Holcroft engineers developed many of the processes and basic principles in the heat treat industry
They realize that their Holcroft furnace is sometimes going to cost more initially than a competitive installation. But that's justified because when all the returns are in, there'll be a lower cost per heat-treated piece.
You, too, can cut your heat-treating cost. Call Holcroft today. Holcroft and Company, 6545 Epworth Blvd., Detroit 10, Michigan.
HOLCROFT & COMPANY
PRODUCTION HEAT TREAT FURNACES FOR EVERY PURPOSE
CHICAGO 9
CLEVELAND 13
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EUROPE

wire such as constantan may be too high for practical use.

To avoid these limitations the three-wire system may be used. Commonly used in resistance thermometry, this system will be adequate for almost all industrial applications. Where even more precision is required the four wire method may be used.

Cylinder Features No-Sag Rod

Hydraulic cylinder with 22-foot stroke, featuring a 24-foot long solid steel piston rod that does not sag under its own weight is announced by Miller Motor Co., Melrose Park, Ill. Planet Products Co., Cincinnati, used the cylinder in construction of an automatic, cylinder operated honing machine. The machine hones tubing to a 15 microinch finish in up to 22-foot lengths and 20-inch bores.

Double acting, low pressure hydraulic cylinder has a 4-inch bore. Piston rod is 2½ inches in diameter, hard chrome plated to resist nicks and scoring. Other long stroke cylinders can be made from Miller components in strokes up to 22 feet in standard bore sizes and mounting styles.

Sheet Metal Facilities Offered

Complete sheet metal facilities at Elkay Mfg. Co. are available for use in subcontract work. Shears, presses, brakes and lathes are a few of the facilities offered. Finishing processes from polishing and galvanizing to enameling are also being turned over to outside contract production. The company, long known as a manufacturer of stainless steel sinks and baths, is at 1870 S. 54th Ave., Chicago 50.

AEC Symposium Summarized

The Role of Engineering in Nuclear Energy Development reports on an engineering symposium held recently at Oak Ridge National Laboratory. Published by the Atomic Energy Commission, it is made available as an aid to industry participation in the atomic energy program.

Papers are included covering such broad phases as "Engineering and the Objectives of the Atomic Energy Commission," "Some Economic Aspects of Atomic Power,"

are you using more copper

THAN IS REQUIRED?

Can you use tubing of a lighter wall, for instance, than you are now using, without losing any efficiency, and still be within standard?

Or if you contemplate a replacement, would a tube of smaller diameter serve the need as well? Would a shorter length suffice?

If, by changing the installation or slightly redesigning the unit, could you effect a saving of tube and still keep the unit at maximum operating efficiency?

Copper, as you know, is in short supply and we must conserve its use wherever possible. If in the case of copper or copper base alloy tubing you can figure out how you can use just a little less than you might normally employ, you will do your part in helping the defense program. If all of us would share in conserving this scarce metal, we could reduce our individual handicap and be able to carry on with very little loss of efficiency.

You can recognize the benefit this cooperative program can bring you.

WOLVERINE TUBE DIVISION
Calumet & Hecla Consolidated Copper Company
INCORPORATED
Manufacturers of seamless, nonferrous tubing
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PLANTS IN DETROIT, MICHIGAN AND DECATUR, ALABAMA
Sales Offices in Principal Cities

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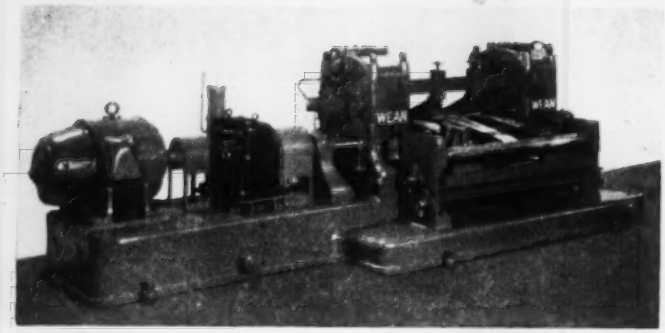


H & S SPEED REDUCERS play a part

in side trimming

strip steel at

high speeds

• Cutting strip steel at high speeds is a tough job and Horsburgh & Scott Speed Reducers play an important role as part of the Wean Side Trimmers . . . available in various sizes for edge trimming hot and cold rolled strip from .006" to ⅜" thick. This is only one of the many fields in industry where H & S Speed Reducers are handling tough jobs for long uninterrupted periods with great savings in maintenance. It will pay you to talk with our engineers about your speed reduction problems.

THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

5112 HAMILTON AVE. • CLEVELAND 14, OHIO, U. S. A.

Send note on Company Letterhead for Speed Reducer Catalog 46

and "The Contributions of Engineering to Nuclear Energy Development." Book contains a total of 17 separate papers in its 509 pages. Copies sell for $1.40 and can be ordered from the Office of Technical Services, Dept. of Commerce, Washington 25, D. C.

Stainless Machining Described

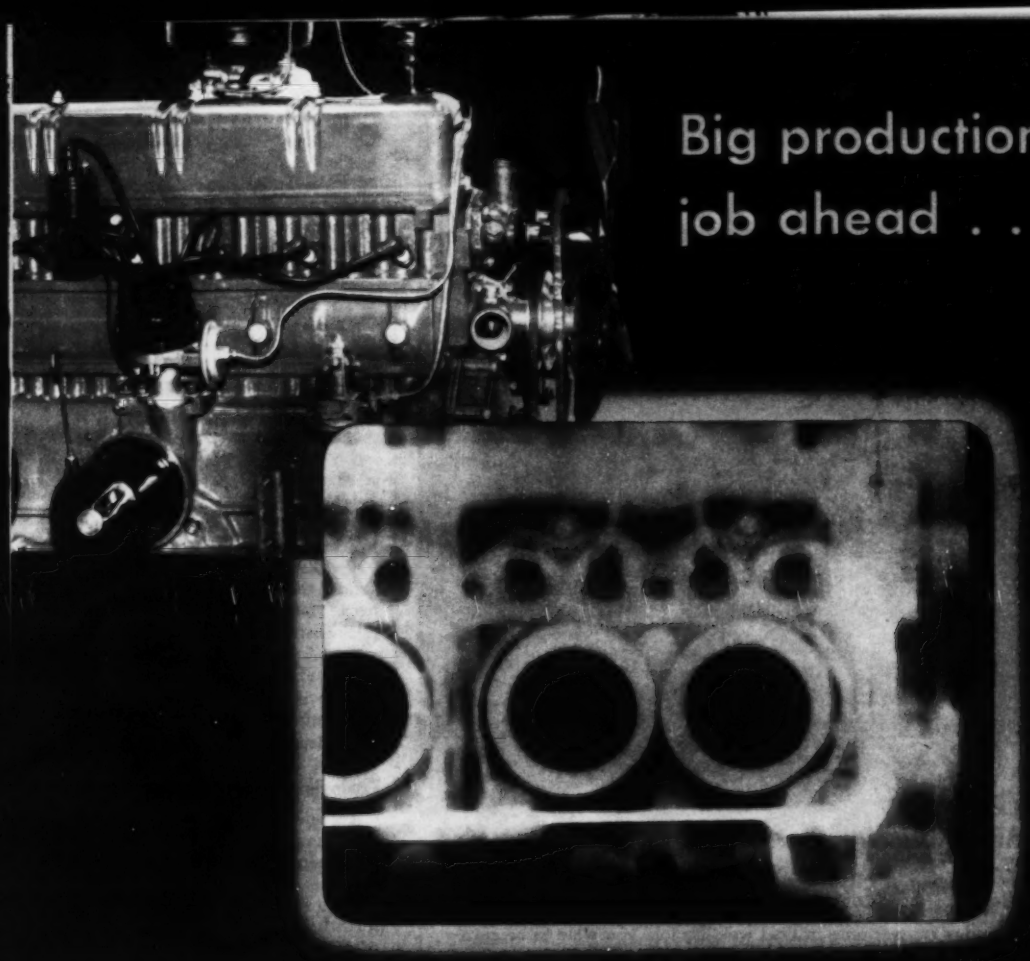
Revised edition of Armco Steel Corp.'s manual on machining stainless steels makes available a complete listing of the company's grades with analyses and individual descriptions of characteristics. Recommended machining speeds are added for extra low carbon grades (304L & 316L) and precipitation-hardening types (17-4 PH & 17-1 PH).

Separate sections illustrate and list operating instructions covering proper selection of feeds and tool composition for turret lathes, heavy duty single and multiple spindle machines, and automatic single-spindle and Swiss type screw machines. Headings follow that show selection charts for tool compositions and cutting fluids, plus tabular data on finishes and tolerances. To obtain copies, contact the company's Product Information Service, Middletown, O.

Steel Checked for Carbon

Studies of crystal structure of metals made at extremely high magnifications with the electron microscope are reported. Substantial increases in the consumption of stainless steels in the next few years may result says A. B. Kinzel, president of Union Carbide & Carbon Research Laboratories Inc., New York. Electron micrographs at 20,000 X were used to study the behavior of carbon in stainless steels. Particular attention was paid to the shape and distribution of chromium carbides. Dr. Kinzel says a new concept has been evolved pointing to more effective control of carbon in stainless. Besides broadening their field of application, it will also make them more effective in many critical uses, such as jet aircraft, atomic energy installations and chemical equipment.

Two developments were indicated by this investigation. One is that in making stainless with



RADIOGRAPHY checks procedure

Here you see a radiograph of a car engine block. It was a new design—almost ready for production. It was important that it be sound, free from sand or gas holes—and with no core shifts.

To be sure, pilot castings were radiographed. It was the one way to know these internal conditions without destroying the casting.

More and more foundries are making radiography a routine procedure. It is the way to be sure only high-quality work is released. In production runs it indicates ways in which methods can be improved and yield increased.

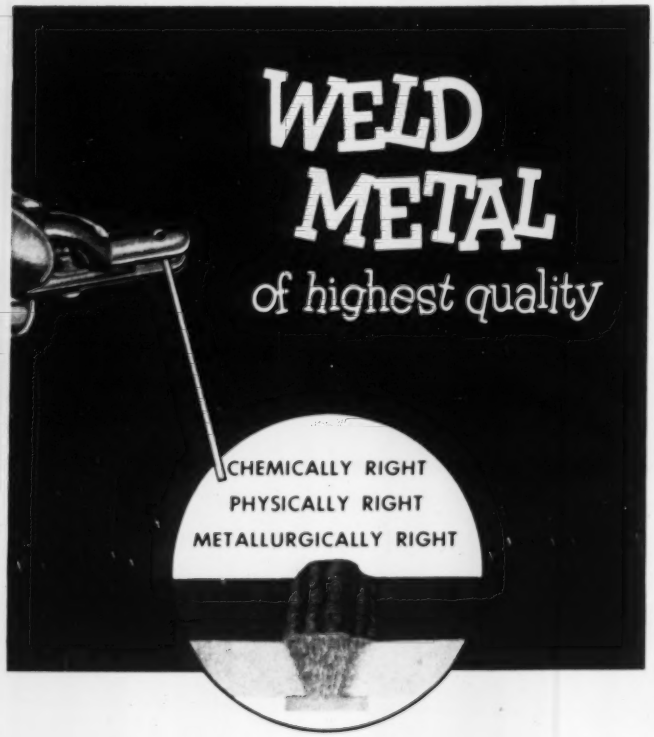
If you would like to know how radiography could improve your plant operation, talk it over with your x-ray dealer. Also, if you wish, we'll send you a free copy of "Radiography as a Foundry Tool."

EASTMAN KODAK COMPANY
X-ray Division, Rochester 4, N. Y.

Radiography . . .

another important function of photography

Kodak
TRADE-MARK



ARCOS Quality Controls on Stainless Electrodes assure you all three!

When you put Arcos Chromend or Stainlend Stainless Electrodes to work on a critical welding job, you want to be sure of consistent, dependable results. That's why every Arcos Stainless Electrode is tested and retested throughout its manufacture. Before it ever reaches your hands it must meet the most critical specifications in the electrode industry. It's your assurance of better weld metal . . . improved welding performance . . . lower weld costs.

ARCOS CORPORATION
1500 S. 50th Street, Philadelphia 43, Pa.

WELD WITH

ARCOS

Specialists in Stainless, Low Hydrogen and Non-Ferrous Electrodes

very low carbon content, particularly for use in welded construction, low-carbon ferrochromium can be used. The other is the use of manganese and nitrogen in those stainless steels where a certain amount of carbon will be present. These would include types used for architectural purposes.

Rule Figures Sheet Sizes

Converting sheet dimensions and gages into pounds and number of sheets is simplified by the Atlanticulator, a vest pocket slide rule. Setting sheet size in inches with gage to be computed, rule gives number of sheets in a given weight or total weight of a given number of sheets. Reverse side lists theoretical weights in pounds per square foot type 302 and 430 stainless sheets from 8 through 28 gage and plates from 3/16-inch through ¾-inch thickness.

Enclosed in a durable transparent vinylite shield, the Atlanticulator is available from Atlantic Polishing Mill, 2600 W. Addison St., Chicago 18.

Explosion Hazards Reduced

Precautions to minimize explosion hazards when handling or processing dusts or powders of titanium, zirconium, thorium, uranium and their hydrides, are outlined in a report from the Bureau of Mines. The study centered on the behavior of 22 powder samples at various temperatures in air and in other gaseous atmospheres.

Experiments showed the advisability of processing and storing many of these metallic powders under helium or argon gas. It also includes some information on vent requirements where dust explosions may occur. Requests for copies of report of investigations 4835 should be addressed to the bureau, Publications Distribution Section, 4800 Forbes St., Pittsburgh 13.

Steel Properties Described

Basic information concerning steel fills the book "Tensile and Hardness Properties of Carbon and Alloy Steel" compiled by the metallurgical department of Heppenstall Co. Specific effects of various alloying elements in steel are

discussed and there is a brief explanation of the manner of development of tensile properties in a steel. Selected iron and steel terms and a number of helpful tables are also contained in this 144-page volume.

Present available copies will be sent on request to Heppenstall at 4620 Hatfield St., Pittsburgh 1. Use your company letterhead and state title or position.

Shell Makers Get Carbide Data

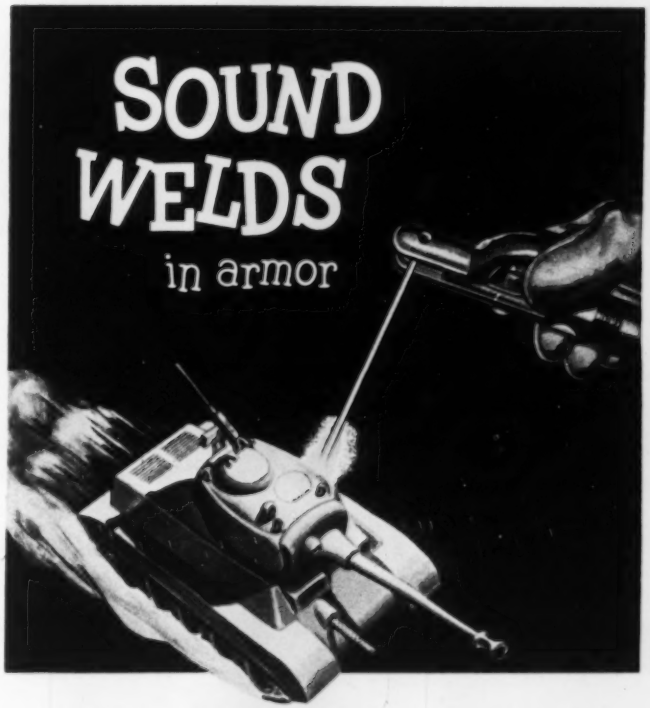
American Ordnance Association has created a carbide cutting tool subcommittee of its shell committee. Representing all manufacturers of tungsten carbide cutting tools the committee is a clearing house for carbide tooling data and carbide problems in shell manufacturing. All available technical data on application of carbides in shell manufacture has been reviewed and a list is available to shell producers. Additional information is being reviewed as rapidly as issued by individual carbide tool companies and shell producers are being advised of them as soon as they are approved by the committee. Assistance is also being given shell producers on organizing of training programs relative to application of carbides in shell production.

Information on available carbide tooling data and communications regarding carbide tooling problems in shell manufacture should be addressed to J. S. Gillespie, chairman, Carbide Cutting Tool Sub-Committee, American Ordnance Association Shell Committee, c/o Carboloy Department, General Electric Co., Box 237, Detroit 32.

Heat Is on Conveyor Problem

Conveyors often carry bulk materials at temperatures over 1000° F says J. Walter Snavely, manager of the Conveyor Equipment Division, Chain Belt Co., Milwaukee. This raises many problems of lubrication, distortion, warpage and rapid wear.

Design of these special conveyors has been along two lines. One has been the use of conventional materials in combination with simple functional conveyor design. This method uses oversized parts, excess capacity, slow operating



Use ARCOS Low Hydrogen Electrodes • Save Critical Alloys

ARCOS LOW HYDROGEN ELECTRODES
Tensilend 70
Tensilend 100
Tensilend 120
Manganend 1M
Manganend 2M
Nickend 2
Chromend 1M
Chromend 2M

There's nothing experimental about welding high tensile steels with Arcos Low Hydrogen Electrodes. They've all been tested by time and service on armor welding as well as commercial applications. Since original development in 1942 the Arcos "family" of Low Hydrogen Electrodes has grown to be one of the most complete.

Every time you use low hydrogen electrodes in place of stainless on welding high tensile steels, you'll be conserving many of the critical alloys so vitally needed today.

ARCOS CORPORATION • 1500 South 50th St., Philadelphia 43, Penna.

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Specialists in Stainless, Low Hydrogen and Non-Ferrous Electrodes

MOTO-TRUCS

GIVE

Greater Service

WITH

Longer Life...

Still in active service after 15 years. The First Moto-Truc Walkie (1936).

Has moved over 2 million lbs.

Traveled over 7,000 miles

Handles 2 Ton loads daily

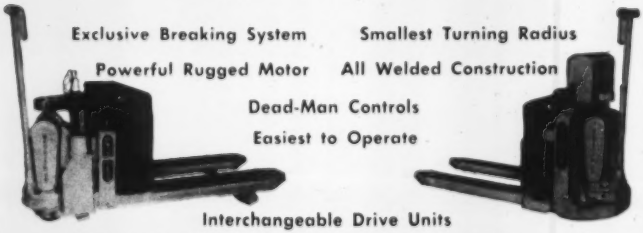
Cost:—a few cents a day

Up to 10 hours on one charge

Saves many Man-hours

A "twist of the wrist" does it.

The matchless performance of this original experimental model of the first "Walkie" is unequaled in the history of materials handling. It has long since paid for itself in many ways. It is SYMBOLIC of Moto-Truc's RUGGED stability.



Exclusive Breaking System — Smallest Turning Radius

Powerful Rugged Motor — All Welded Construction

Dead-Man Controls

Easiest to Operate

Interchangeable Drive Units

Thousands of Moto-Truc Walkies are in daily use all over the country. They operate on rigid, daily schedules with no loss of their original efficiency.

MOTO-TRUC'S 6 BASIC MODELS ARE QUICKLY ADAPTABLE TO ANY PROBLEM IN THE WALKIE FIELD

DON'T BE SATISFIED WITH LESS THAN THE BEST.

THE MOTO-TRUC CO.

SEND FOR Bul. No. 51

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PALLET, PLATFORM AND HI-LIFT TRUCKS

LARGEST EXCLUSIVE MANUFACTURER OF WALKIES

MOTO-TRUC — Designers for the Industry — PATENTED

speeds and the shielding of working parts from maximum temperature zones. The other approach has been the use of special heat resisting alloys for the working parts, insulation, and heat dissipation to minimize the effects of high temperature. Mr. Snavely's approach is to organize and make available information on the most successful engineering experience with this problem.

Fume Cooler Installed

Cupola fume collection system that uses an American Dustube fume collector made by the American Wheelabrator & Equipment Corp., Mishawaka, Ind., is being installed at Lincoln Foundry Co., Los Angeles. System will include a quencher cooling gases from an estimated peak of 1950° F to 450° F. This quencher will be followed by a secondary cooler to bring gases down to 275° F.

Filter tubes are made of Orlon Acrylic fiber that has a maximum operation temperature of 275° F. Because of its high tensile strength and flexing resistance, this fabric can be shaken mechanically to dislodge collected particles. The five-compartment collection will be entirely automatic, requiring no manual labor for manipulating damper valves and shaking bags.

Tests Will Brand Stainless

Tests for quickly segregating types of stainless steels are given on a chart from the Carpenter Steel Co. The chart diagrams the stainless type numbers and describes how and when to use each of 11 different tests for identifying them.

Useful in identifying mixed stocks and in separating stainless scrap for salvage, the tests are not designed to supplant chemical analysis. Copies can be obtained from the company, 339 W. Bern St., Reading, Pa.

Pipe Flange Standards Released

Three standards in the field of pipe flanges and fittings are approved by the American Standards Association, New York. They are: Nonmetallic gaskets for pipe flanges; wrought copper and bronze solder-joint fittings; and

in WIRE ROPE, too the RIGHT KIND of muscle makes the difference

Endowed with highly specialized leg muscles, the kangaroo is able to make tremendous flying leaps—even with Junior perched in the rumble seat.

In wire rope, too, specialized jobs call for specialized muscles. That's why in Wickwire Rope we make sure you always get the proper combination of physical properties to best resist the destructive forces found on your particular job—whether it be abrasion, load strain, shock stress or bending fatigue.

Wickwire Rope gives you the benefit of long experience and specialized know-how which assures you of exactly the right kind of rope your particular job demands.

For additional information write or phone our nearest sales office.

THE COLORADO FUEL & IRON CORPORATION—Abilene (Tex.) • Denver • Houston • Odessa (Tex.) • Phoenix • Salt Lake City • Tulsa

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WICKWIRE SPENCER STEEL DIVISION—Boston • Buffalo • Chattanooga • Chicago • Detroit • Emlenton (Pa.) • New York • Philadelphia

WICKWIRE ROPE

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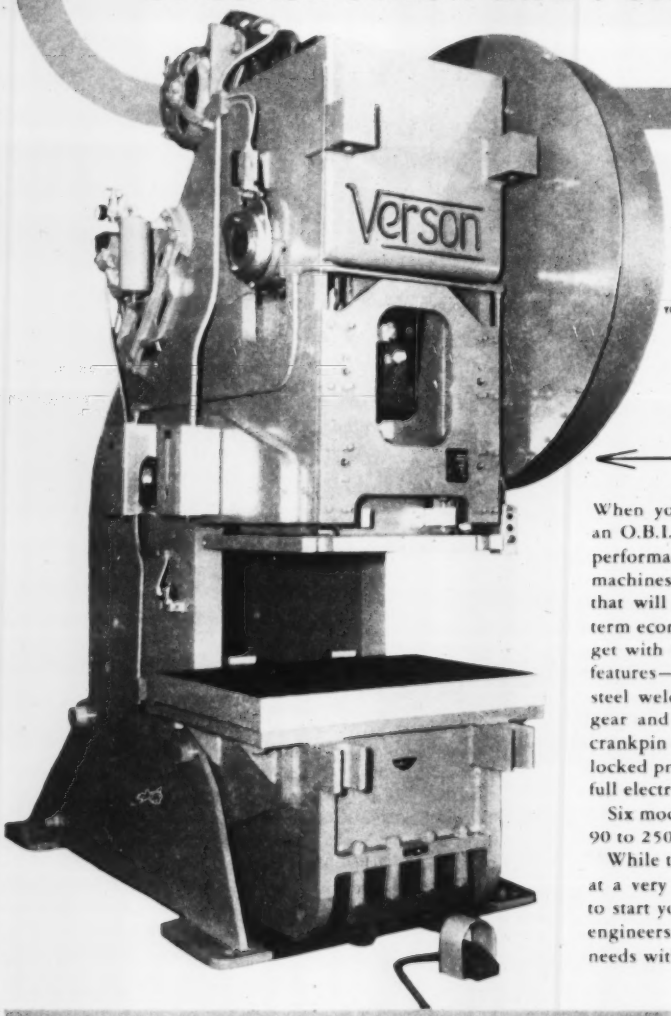
PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL & IRON CORPORATION

WICKWIRE ROPE
A CF&I PRODUCT

LOOK FOR THE YELLOW TRIANGLE ON THE REEL

You get BIG Press Standards of Construction and Performance



in TRADE Verson MARK O.B.I.'s

When you can combine the versatility of an O.B.I. press with the construction and performance standards of big, expensive machines, you get a real production tool that will give you the best possible long term economy . . . And that's just what you get with Verson O.B.I.'s. Just check these features—gears running in oil . . . heavy all-steel welded frame . . . machine cut steel gear and pinion . . . split cap main and crankpin bearings . . . mechanically interlocked pneumatic clutch and brake unit . . . full electric controls . . . many others.

Six models, with capacities ranging from 90 to 250 tons are available.

While the demand for Verson Presses is at a very high level, now is a good time to start your long range planning. Verson engineers will be pleased to go over your needs with you.

Originators and Pioneers of Allsteel Stamping Press Construction

VERSON ALLSTEEL PRESS COMPANY

9318 South Kenwood Avenue, Chicago 19, Illinois — So. Lamar at Ledbetter Dr., Dallas 15, Texas

A VERSON PRESS FOR EVERY JOB FROM 60 TONS UP

MECHANICAL AND HYDRAULIC PRESSES AND PRESS BRAKES • TRANSMAT PRESSES • TOOLING
DIE CUSHIONS • COMPRESSION AND TRANSFER MOLDING PRESSES

malleable iron screwed fittings, 150-pound. Copies of the three standards are available from the association, 70 E. 45th St., New York 17.

Care Boosts Lamps' Light

Planned maintenance of both light sources and reflecting surfaces saves costly time and useful light. Bulletin from Sylvania Electric Products Inc. points out an eight-step program of planned fluorescent lighting maintenance. Advantages are suggested of planned group replacement of lamps as compared to one-at-a-time replacements.

C. A. Burton, general sales manager of the company's Lighting Division says, "Research and experience has shown that even the most modern industrial fluorescent lighting installations rapidly become inefficient because of poor maintenance procedures." Requests for the booklet should be addressed to the Lighting Division, 60 Boston St., Salem, Mass.

Machine Meets Fine Tolerances

Rotary straightener installed by Mackenzie Walton Co. enables the seamless tube firm to meet more exacting specifications at its Pawtucket, R. I., plant. Made by Mackintosh-Hemphill Co., Pittsburgh, the straightener takes largely 70-30 brass, from 0.175 to 0.500-inch OD, through its six power-driven cross rolls.

Company reports an example of current work is meeting an 0.005-inch per foot straightness tolerance on tube that is 0.400-inch OD, 0.007-inch ID, with tensile strength of 80,000-85,000 psi. Machine's rated speed is 120 fpm. Bulk of the company's output goes to gage, instrument and electronics industries.

Metallic Acetate Samples Shown

Samples of metallic acetates and polystyrenes are shown, with complete description and specification, in a six-page folder available from Coating Products, New York. An accompanying color chart shows their entire color and finish range. Requests for folder and chart should go to the company, 136 W. 21st St., New York 11.

CALENDAR
OF MEETINGS

March 10-14, National Electrical Manufacturers Association: Spring meeting. Edgewater Beach Hotel, Chicago. Association address: 155 E. 44th St., New York 17. Managing director: W. J. Donald.

March 10-14, National Association of Corrosion Engineers: Annual conference and exhibit. Hotels Buccaneer and Galvez and Galveston Municipal Pier, Galveston, Tex. Association address: 919 Milam Bldg., Houston 2. Secretary: A. B. Campbell.

March 11-14, Society of the Plastics Industry Inc.: National Plastics Exposition. Convention Hall, Philadelphia. Society address: 67 W. 44th St., New York 18. Executive vice president: William T. Cruse.

March 12-14, American Society of Training Directors: Annual conference. French Lick Hotel, French Lick Springs, Ind. Secretary: R. L. Moberly, University of Wisconsin, Madison, Wis.

March 14, American Supply & Machinery Manufacturers Association and National Industrial Distributors Association: Regional meeting. Palmer House, Chicago. Conference publicity: Du Pont Circle Bldg., Washington 6.

March 16-19, American Institute of Chemical Engineers: Annual spring conference. Biltmore Hotel, Atlanta. Institute address: 120 E. 41st St., New York 17. Secretary: Stephen L. Tyler.

March 17-19, Midwest Conference on Fluid Mechanics: Ohio State University, Columbus, O. General conference chairman: Prof. A. N. Tifford, aeronautical engineering department, Ohio State University.

(Continued on page 134)

What's New in New Jersey

. . . Just recently opened to traffic is the New Jersey Turnpike—probably the world's finest piece of highway engineering. The Turnpike was built by private capital in the remarkably short time of 24 months at a cost of $225,000,000.

. . . Crossing the state from George Washington Bridge to the Delaware Memorial Bridge at Deepwater, it permits direct non-stop 60-mile-an-hour traffic. Ultimately it will connect with the Pennsylvania Turnpike and the to-be-built Maryland Express Highway to give fast trucking between New Jersey and Pittsburgh, Baltimore and Washington.

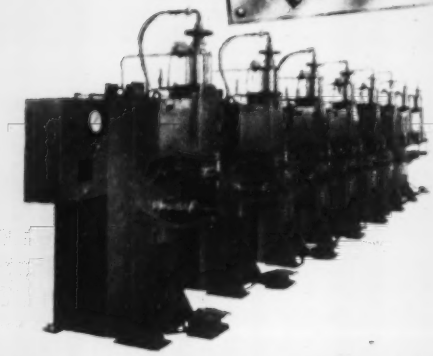
. . . This Turnpike is an important addition to New Jersey's magnificent highway system which consists of more than 1700 miles of paved state highways and some 6000 miles of hard-surfaced county roads.

. . . Industry finds this highway system of great value in efficient distribution of products to the vast over-night trucking market contiguous to New Jersey.

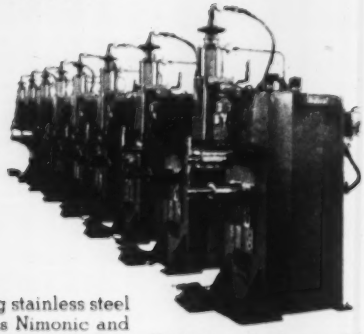
Write for your copy of the new digest about New Jersey—"An Industrialist's View of the Crossroads of the East"—Box B, Public Service Electric and Gas Company, 76 Park Place, Newark, New Jersey.

PUBLIC SERVICE

STAINLESS EXPERTS CHOOSE Federal



SINGLE PHASE *for* PRODUCTION LINE WELDING . . .



If you're welding stainless steel or alloys such as Nimonic and want the lowest cost and most efficient methods possible, get the Federal story before you buy your first piece of equipment.

The welders pictured on this page are part of a shipment to a nationally known stainless steel fabricator* who has worked with Federal engineers in making exhaustive studies on the subject. The welders are of the Federal Press Type Single Phase design that have been in constant use by this company for many years.

One of the nation's largest builders of resistance welders of all types — single phase or three phase — Federal will help you get the exact welder you need to do the best job. Contact your nearest Federal representative or write direct.

*Name on request

Federal® WELDERS

Marco PRESSES®

THE FEDERAL MACHINE & WELDER CO.

WARREN, OHIO

(continued from page 133)

March 17-19, National Association of Waste Material Dealers Inc.: Annual meeting. Waldorf-Astoria Hotel, New York. Association address: 271 Madison Ave., New York. Secretary: Clinton M. White.

March 17-21, American Society of Tool Engineers: Annual meeting and biennial industrial exposition. International Amphitheater, Chicago. Society address: 10700 Puritan Ave., Detroit. Secretary: Harry Conrad.

March 18-19, Steel Founders' Society of America: Annual meeting. Edgewater Beach Hotel, Chicago. Society address: 920 Midland Bldg., Cleveland 15. Secretary: F. Kermit Donaldson.

March 18-19, Export Managers Club of New York: Annual meeting. Hotel Statler, New York. Address: Two Lafayette St., New York 7.

March 20-21, Pressed Metal Institute: Spring technical meeting. Hotel Carter, Cleveland. Institute address: 13210 Shaker Square, Cleveland 20. Manager: Orrin B. Werntz.

March 21, Materials Handling Institute: Edgewater Beach Hotel, Chicago. Institute address: 731-732 DuPont Circle Bldg., Washington 6. Managing director: R. Kennedy Hanson.

March 22-April 6, Chicago International Trade Fair: Navy Pier, Chicago. Executive director: John N. Gage, Col., U.S.A., Ret. Address: Merchandise Mart, Chicago.

March 23-27, Buffalo; March 30-April 3, Milwaukee—American Chemical Society: Annual spring meeting. Society address: 1155 16th St. NW, Washington 6. Executive secretary: Alden H. Emery.

March 24-25, American Hot Dip Galvanizers Association Inc.: Annual meeting. Hotel Drake, Chicago. Association address: 2311 First National Bank Bldg., Pittsburgh 22. Assistant secretary: Stuart J. Swensson Jr.

March 24-26, American Society of Mechanical Engineers: Spring meeting. University of Washington, Seattle. Society address: 29 W. 39th St., New York 18. Secretary: C. E. Davies.

March 24-28, National Association of Power Engineers Inc.: National power conference and exhibit. Hotel Sherman, Chicago. Association address: 176 W. Adams St., Chicago. Secretary: A. F. Thompson.

March 24-28, National Association of Manufacturers: Institute of Industrial Relations. Boca Raton Club, Boca Raton, Fla. Association address: 14 W. 49th St., New York 20. Institute director: Sibyl S. Patterson.

March 30-31, Packaging Machinery Manufacturers Institute: Semi-annual spring meeting. Hotel Dennis, Atlantic City, N. J. Institute address: 342 Madison Ave., New York 17. Secretary: Helen L. Stratton.

March 31-April 2, International Acetylene Association: Annual spring meeting. Hotel Claypool, Indianapolis. Association address: 30 E. 42nd St., New York 17. Secretary: H. F. Reinhard.

March 31-April 2, American Institute of Mining & Metallurgical Engineers: National open hearth conference. William Penn Hotel, Pittsburgh. Institute address: 29 W. 39th St., New York 18. Secretary: Ernest Kirkendall.

April 1-3, Steel Shipping Container Institute: Annual meeting. Hotel Biltmore, Palm Beach, Fla. Institute address: 600 Fifth Ave., New York 20. Secretary: L. B. Miller.

April 1-4, American Management Association: National packaging exposition and conference. Atlantic City Auditorium, Atlantic City, N. J. Association address: 330 W. 42nd St., New York. Secretary: James O. Rice.

April 3-4, Instrument Society of America: Annual steel instrumentation symposium. Hotel Roosevelt, Pittsburgh. Society address: 921 Ridge Ave., Pittsburgh 12. Secretary: Richard Rimbach.

April 4-5, National Association of Cost Accountants: Regional cost conference. Indianapolis. Association address: 505 Park Ave., New York 22. Secretary: A. B. Gunnarson.

April 7-8, American Management Association: Production conference. Hotel Statler, New York. Association address: 330 W. 42nd St., New York. Secretary: James O. Rice.

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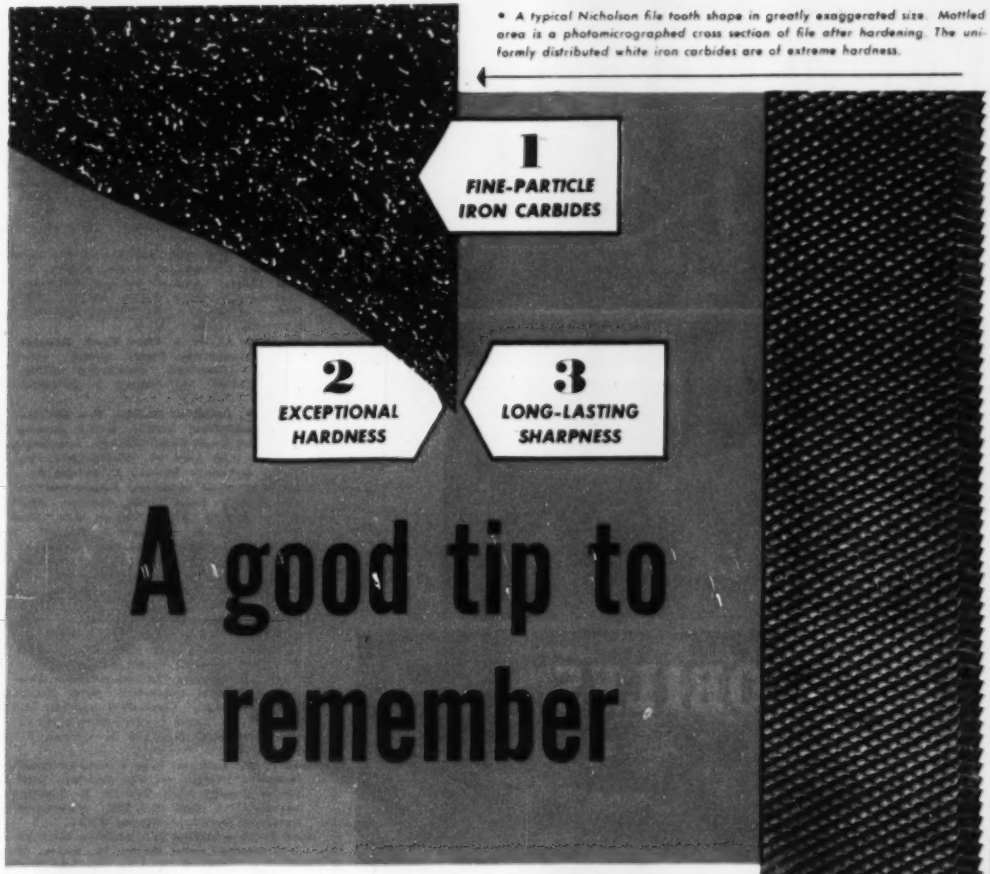


• *A typical Nicholson file tooth shape in greatly exaggerated size. Mottled area is a photomicrographed cross section of file after hardening. The uniformly distributed white iron carbides are of extreme hardness.*

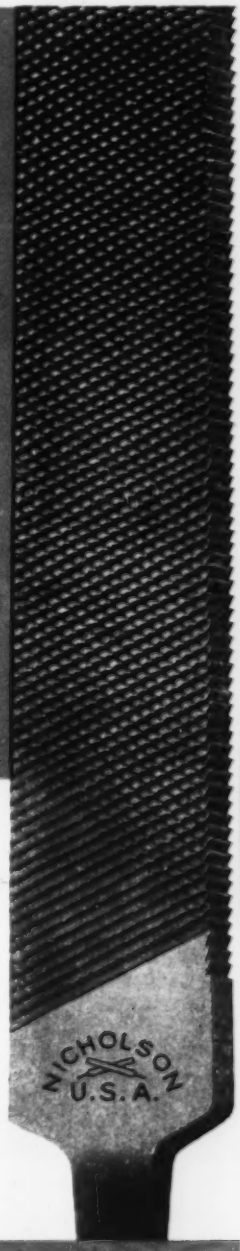
A good tip to remember

In a file, it's the tip of the tooth that counts. That's the part which does the work. On it depend the file's cutting efficiency and serviceable life. Nicholson metallurgy, tooth designing, cutting machinery, hardening processes—all combine to put onto Nicholson and Black Diamond file teeth the strongest, sharpest, longest-lasting tips science and human skill can achieve.

That's why the tips of the teeth give you the tops in file performance (plus the tops in value) when you buy Nicholson or Black Diamond brands. Your industrial distributor will back up that statement.

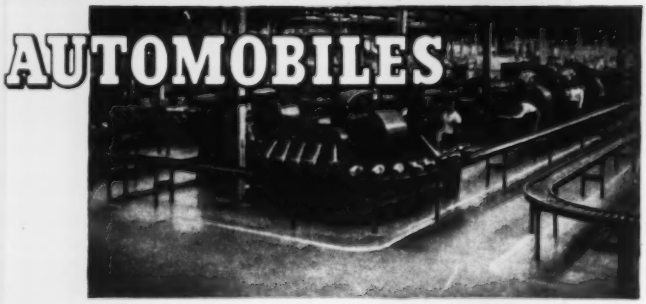
• • •

READ MORE ABOUT FILE QUALITY, kinds, use and care in Nicholson's famous 48-page illustrated book, "**FILE FILOSOPHY.**" It's ***FREE.*** Send for your copy.



NICHOLSON FILE COMPANY • 71 ACORN STREET, PROVIDENCE 1, RHODE ISLAND
(In Canada, Port Hope, Ont.)

NICHOLSON ... A FILE FOR EVERY PURPOSE



Production increased — handling costs cut — in these and many other industries with Standard Conveyors.

The installations shown above are representative of the range and versatility of Standard Conveyors. An experience record of more than 45 years, serving all classes of industry and business, qualifies Standard to be of service on any conveyor need — roller, belt, slat, chain, wheel, push-bar, sectional, portable, self-contained conveyor units — pneumatic tube systems. Write —

Write to Dept. ST-32 for valuable reference book "Conveyors by Standard" and tell us what you want to convey.

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INCLINEBELT • LEVEL BELT • EXTENDOVEYOR
UTILITY BELT-VEYOR • HANDI-DRIVE
VERTICAL LIFTS • PNEUMATIC TUBE SYSTEMS

(concluded from page 134)

April 7-9, American Society of Lubrication Engineers: Annual meeting, Hotel Statler Cleveland. Society address: 343 S. Dearborn St., Chicago 4. Secretary: W. F. Leonard.

April 9, Cutting Tool Manufacturers Association. Spring meeting, Hotel Cleveland, Cleveland. Association address: 416 Penobscot Bldg., Detroit. Secretary: Emil Gaiting.

April 9-11, Society of the Plastics Industry Inc.: Annual technical session, Reinforced Plastics Division, Edgewater Beach Hotel, Chicago. Society address: 67 W. 44th St., New York 18. Secretary: William T. Cruse.

April 16-18, American Institute of Electrical Engineers & American Welding Society, Detroit Section: Annual welding conference, Rackham Memorial Bldg., Detroit. Conference publicity: J. S. Francis, Consumers Power Co., Jackson, Mich.

April 17-18, Caster & Floor Truck Manufacturers Association: Spring meeting, Hotel Hollenden, Cleveland. Association address: 7 W. Madison St., Chicago 2. Secretary: Harry P. Dolan.

April 17-18, American Machine Tool Distributors Association: Annual spring meeting, Edgewater Beach Hotel, Chicago. Association address: 1900 Arch St., Philadelphia. Executive secretary: Thomas A. Fernley Jr.

April 18-19, Lead Industries Association: Annual meeting, Hotel Drake, Chicago. Association address: 420 Lexington Ave., New York 17. Secretary: Robert L. Ziegfeld.

April 18-19, National Association of Cost Accountants: Regional cost conference, Atlanta. Association address: 505 Park Ave., New York 22. Secretary: A. B. Gunnarson.

April 18-21, Grinding Wheel Institute: Spring meeting, The Homestead, Hot Springs, Va. Institute address: 2130 Keith Bldg., Cleveland 15. Secretary: Frank G. Gustafson.

April 20-24, National Industrial Service Association: Annual convention, Hotel Conrad Hilton, Chicago. Association address: 818 Olive St., St. Louis 1. Convention publicity: McGiveran-Child Co., 162 N. Clinton St., Chicago 6.

April 21-22, American Coke & Coal Chemicals Institute: Eastern regional meeting, Westchester Country Club, Rye, N. Y. Institute address: 711 14th St. NW, Washington. Executive secretary: Samual Weiss.

April 21-22, American Zinc Institute Inc.: Annual meeting, Hotel Statler, St. Louis. Institute address: 60 E. 42nd St., New York 17. Secretary: Ernest V. Gent.

April 21-24, Society of Automotive Engineers: National aeronautic and aircraft engineering display, Hotel Statler, New York. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

April 21-25, American Institute of Steel Construction Inc.: Spring engineering conference, New York. Institute address: 101 Park Ave., New York 17. Secretary: L. Abbett Post.

April 27-May 1, American Ceramic Society: Annual meeting, William Penn Hotel, Pittsburgh. Society address: 2525 N. High St., Columbus, O. Secretary: Charles S. Pearce.

April 28-May 3, Concrete Reinforcing Steel Institute: Annual meeting, The Greenbrier, White Sulphur Springs, W. Va. Institute address: 38 S. Dearborn St., Chicago 3. Secretary: H. C. Beitzell.

April 28-29, Association of Iron & Steel Engineers: Spring conference, Netherland Plaza Hotel, Cincinnati. Association address: 1010 Empire Bldg., Pittsburgh 22. Managing director: T. V. Ess.

April 28-30, Chamber of Commerce of the U. S.: Annual meeting, Chamber of Commerce Bldg., 1615 H St. NW, Washington 6. Executive vice president: Arch N. Booth.

April 29-30, Metal Powder Association: Annual spring meeting, Hotel Drake, Chicago. Association address: 420 Lexington Ave., New York 17. Acting secretary: Robert L. Ziegfeld.

April 30-May 4, Industrial Diamond Association of America Inc.: Annual meeting, Princess Hotel, Bermuda. Association address: 124 E. 40th St., New York. Secretary: Athos D. Leveridge.

MACK-HEMP

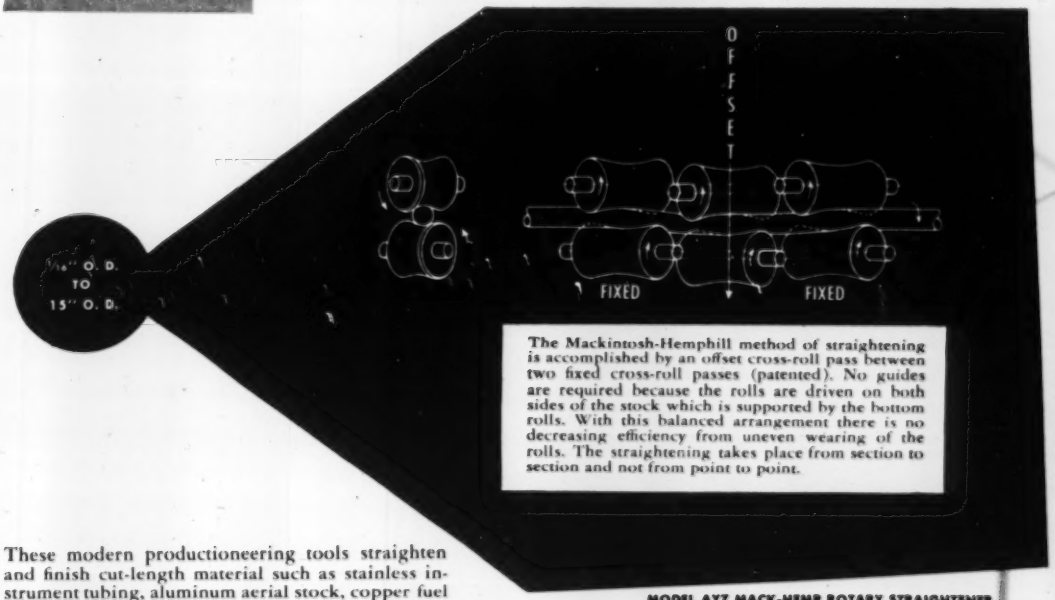
guideless rotary straighteners

FOR

production-line straightening and finishing

OF

metal tubing and pipe



The Mackintosh-Hemphill method of straightening is accomplished by an offset cross-roll pass between two fixed cross-roll passes (patented). No guides are required because the rolls are driven on both sides of the stock which is supported by the bottom rolls. With this balanced arrangement there is no decreasing efficiency from uneven wearing of the rolls. The straightening takes place from section to section and not from point to point.

MODEL AYZ MACK-HEMP ROTARY STRAIGHTENER. NOTE CIGARETTE LIGHTER AT LOWER LEFT.

These modern productioneering tools straighten and finish cut-length material such as stainless instrument tubing, aluminum aerial stock, copper fuel lines, aviation brake tubing, standard welded pipe, heavy-wall seamless alloy tubes, large diameter wrought-iron pipe, and many other ferrous and non-ferrous tubular products *in sizes ranging from 1/16" O.D. to 15" O.D.*

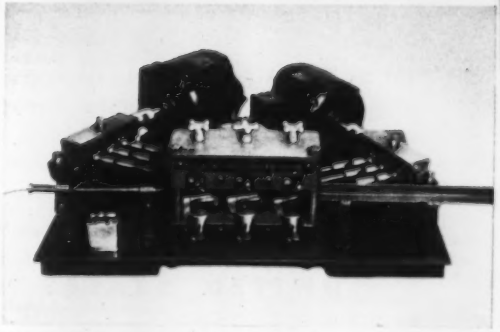
Mack-Hemp Rotary Straighteners employ a six-roll arrangement, basic in all sizes, which

- **STRAIGHTENS to precision tolerances, end-to-end**
- **FINISHES without leaving spiral scores, cuts, or rub marks on exterior surfaces**
- **REMOVES and bends from cut-length stock**
- **SPEEDS straightening and surface finishing operations**

Mackintosh-Hemphill Rotary Straighteners employ a patented roll arrangement with an offset cross-roll pass between two fixed cross-roll passes.

This feature eliminates supporting guides for the material and increases the productive life of the rolls.

Send for bulletin S-7265 which describes in detail, the Mack-Hemp Rotary Straightener.



MACKINTOSH-HEMPHILL

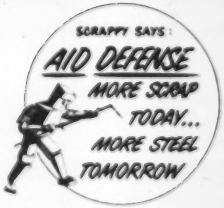
COMPANY

PITTSBURGH and MIDLAND, PENNSYLVANIA

MACKINTOSH-HEMPHILL PRODUCTS INCLUDE: **ROLLS . . . STEEL AND SPECIAL ALLOY CASTINGS . . . COMPLETELY INTEGRATED STRIP MILLS . . . HEAVY DUTY ENGINE LATHES . . . MACKINTOSH-HEMPHILL ROTARY STRAIGHTENERS . . . IMPROVED JOHNSTON PATENTED CORRUGATED CINDER POTS AND SLAG-HANDLING EQUIPMENT . . . SHAPE STRAIGHTENERS . . . END-THRUST BEARINGS . . . SHEARS . . . LEVELLERS**

Indignant about the steel shortage?

Let us try to help you! In the supplies of steel that are available, we can often find a type of steel that will answer your particular purpose. Call one of our salesmen the next time you are faced with a steel supply problem. Our experience and resources may furnish your solution.



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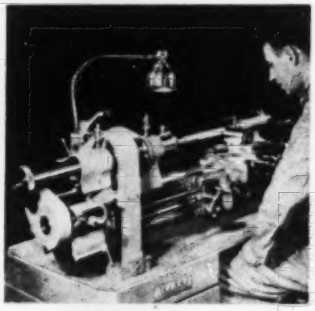
USS **UNITED STATES STEEL**

New Products and Equipment

Lathe Works at High Accuracy

USE REPLY CARD—CIRCLE No. 1

Instrument lathe offered by Rivett Lathe & Grinder Inc., Brighton 35, Boston, Mass., turns or bores within 0.0001-inch in 6 inches work held in collet or between centers. Its bronze-bearing spindle is capable of extreme turning, accuracy and finish. A back-



. . . bores to 0.0001-inch in six inches work

geared, screw cutting engine unit, it has attachments available for completing an entire series of metalworking operations.

Performance within above limits is attained by three point bed mounting; double-bevel alignment for head and tailstock; 76-sq in. carriage bearing on the bedways; and separate lead screw for thread cutting. Other fixtures include double taper, self-aligning spindle bearings and heat treated precision ground feed screw.

Coiler Makes Precision Springs

USE REPLY CARD—CIRCLE No. 2

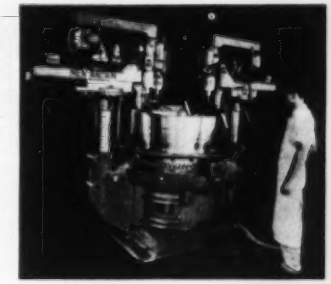
Precision spring coiler, made by Perkins Machine & Gear Co. and marketed by Connors & Davis Sales Corp., Circuit Ave., W. Springfield, Mass., provides torsion, compression, extension and tapered springs, coiled right or left without changing arbors. It handles wire stock from 0.005 to 0.125-inch. Springs can be made with or without initial tension and with open or closed ends.

Wire is fed down between two rolls through a guide, then locked securely by a movable wire guide and an arbor. While springs are being coiled, outside diameter can be changed. To coil tapered or conical springs, outside diameter adjustment screw is turned gradually, forming a larger or smaller diameter. Pitch or lead in springs is regulated by knurled adjustment screw on the coiler's front.

Tool Drills Jet Assembly Holes

USE REPLY CARD—CIRCLE No. 3

Circular pattern drilling machine developed by New Britain Machine Co., New Britain, Conn., is designed to meet problems of work-hardening and flange distortion in drilling jet engine assembly holes. Machine drills without using expensive jigs and fixtures and with



. . . no work hardening or flange distortion

standard indexing. It works regular or irregular hole spacings from 4 to 100 indexes in circles to 48 inches diameter. Pieces to 61 inches diameter can be mounted. In steel, maximum hole diameter is ½-inch.

Equipped with 1 to 4 spindles, it can drill four holes simultaneously or can be set up to drill, ream and tap, or drill, ream and countersink successively at one setup. Whole operation is automatic except indexing work to successive positions.

Release Prevents Overloading

USE REPLY CARD—CIRCLE No. 4

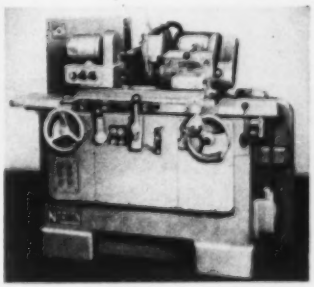
Overload release, made by Dodge Mfg. Corp., Mishawaka, Ind., for use on its torque-arm speed reducer, provides instant and positive protection for machines, motors and the reducer itself. Called the Tri-Matic overload release, it operates mechanically and electrically to loosen belts, cut off current and activate a warning signal. Pressure exerted by an excessive load causes a piston to move lengthwise through the unit to initiate the first two safety features. Warning system is hooked up to the microswitch. Release is calibrated for adjustment to load conditions of any job up to the reducer's maximum capacity.

REPLY CARDS
on page 155 will bring you more information on any new products and equipment in this section.

Grinder Works Small Parts

USE REPLY CARD—CIRCLE No. 5

Cylindrical grinder made by Norton Co., Worcester 6, Mass., is available as a plain or semiautomatic machine in 12 or 18-inch work length capacities. Made for accurate grinding of small cylindrical parts, the 4-inch type CTU has a graduated handwheel to



. . . made as plain or semiautomatic machine

simplify wheel feed and job setup. Click-count indexing mechanism makes fine feed settings by feel rather than by setting an index pin in a target. This mechanism clicks a detent on rotation of its control knob, each click representing a setting for 0.0001-inch work diameter reduction.

Grinding and truing table speeds are independently adjustable. Selector switch provides automatic or

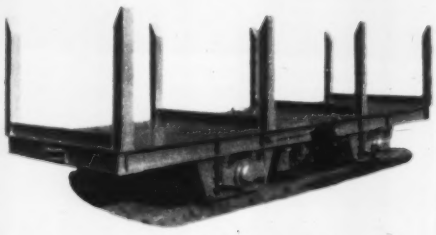
WALK-ALONG SAFETY TYPE FLAT CARS adapted to your HAULAGE NEEDS

ATLAS CARS

Atlas Walk-Along storage battery operated flat cars show considerable savings over other methods of handling heavy, bulky loads over short distances. They are safe to use because operation is controlled by one lever and they travel no faster than a man can walk.

20-TON BATTERY OPERATED

The steel plate deck section over battery and charging equipment is removable for easy access. Plug-in connection to automatic battery charger on car is located conveniently at side of car next to ampere hour meter. Car moves at slow speed in direction controller lever is moved and stops when lever is released.



40-TON BATTERY OPERATED

This safety-type flat car is equipped with side stakes and cross bunks so that crane slings may be inserted to handle loads. Deck section is hinged to provide access to equipment, including automatic battery charger which may be plugged into plant circuit whenever car is at rest so that car is available for 24-hour service. Car can be furnished with plain deck, operator's platform, or other special features if required.

Ask for Walk-Along Bulletin 1283 For Full Details.

THE ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS

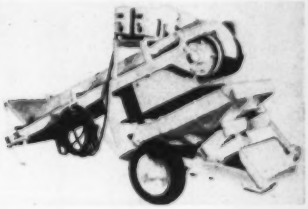
3760 IVANHOE RD. CLEVELAND 10, OHIO, U. S. A.

manual work rotation and coolant flow control. Semiautomatic version provides automatic, adjustable grinding cycles, controlled by movement of a single lever. Wheel spindle unit has long, full, pressure lubricated bearings that enclose more than half the wheel's spindle body.

Portable Sand Conditioner

USE REPLY CARD—CIRCLE No. 6

An addition to its line of floor sand preparation machines is announced by Beardsley & Piper Division, Pettibone Mulliken Corp., 2424 N. Cicero Ave., Chicago 39, Ill. Called the Magnarator, the machine is a portable conditioner,



. . . for magnetic separation and screening

made to provide both magnetic separation and screening for small and medium size foundries. Rubber-tired wheels facilitate movement within the plant. It is built for shovel loading, in two sizes having capacities of 20 and 30 tons of sand per hour.

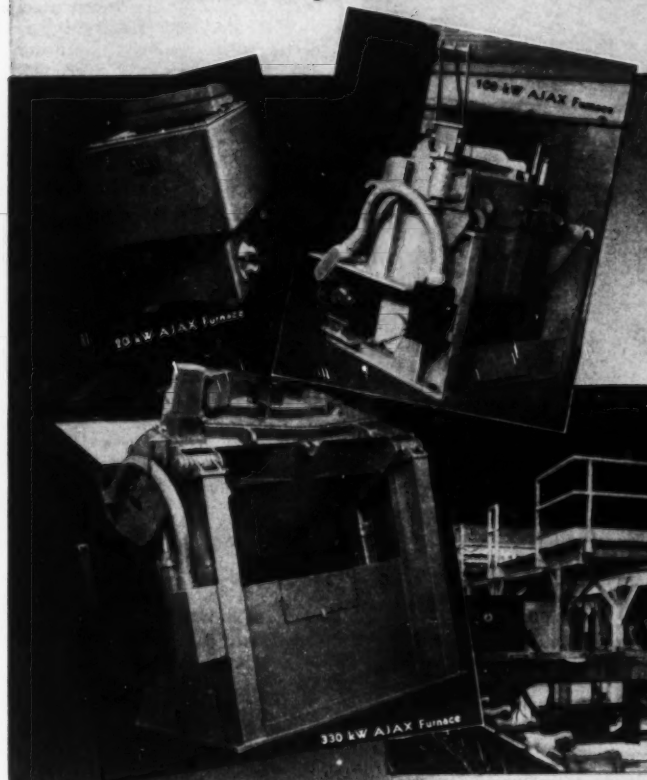
Piercing Unit Exerts 12½ Tons

USE REPLY CARD—CIRCLE No. 7

Complete line of portable hydraulic piercing units incorporating automatic hydraulic stripping action is offered by Danly Machine Specialties Inc., 2100 S. Laramie Ave., Chicago 50, Ill. Based on power cylinder design, the unit is compact, completely hydraulic in action. The 45-pound model exerts a force of 5 tons at 2000 psi working pressure; maximum capacity is 12½ tons at 5000 psi.

Application can be made in a variety of general metalworking operations, such as riveting, trimming, bending or extruding, in addition to the primary piercing function. Units are made especially for work on heavy or awkward workpieces where handling is difficult and for contract work where quick adaptability to sev-

Yes! AJAX Induction Melting Furnaces are Versatile!



SOME APPLICATIONS

- Die Castings
- Sand Castings
- Permanent Mold Castings
- Scrap Recovery
- Billets for Rolling and Extrusion
- Galvanizing and Aluminizing of Steel
- Continuous Casting of Metals

AJAX-TAMA-WYATT Low Frequency Induction Furnaces are made in a wide range of sizes, from 20 to 1000 kW, to meet demand for large volume or small special lots. They are adapted to the full range of non-ferrous metals and alloys. Their use insures faster production, uniform quality, less maintenance and lower operating cost.

Rejects are reduced. For special applications, an Automatic Electromagnetic Pump allows continuous feeding of molten metal into the molds as they move past. Hand ladling is eliminated. Temperature is also automatically controlled and there is no chance of overheating the bath at any time during the melting cycle.

WRITE FOR FURTHER INFORMATION

AJAX ENGINEERING CORP., TRENTON 7, N. J.

AJAX TAMA-WYATT **INDUCTION MELTING FURNACE**

AJAX ELECTRO METALLURGICAL CORP., and Associated Companies
AJAX ELECTROTHERMIC CORP., Ajax Northrup high Frequency Induction Furnaces
AJAX ELECTRIC CO., INC., The Ajax Hultgren Electric Salt Bath Furnace
AJAX ELECTRIC FURNACE CORP., Ajax Hyatt Induction Furnaces for Melting

get your product out of a packaging rut

Motorists buy Claw Tire Chains . . . *because of the package.* It's a practical package—one that not only makes the product more attractive, but easier to use, and simple to store in the luggage compartment of the car when not in use. Dealers like the package too; outstanding in display, requiring no re-packing or wrapping, and stimulating the buyer to take his purchase with him, it simplifies the selling job all around.

An adaptation of this idea may be the merchandising boost you want for your product. The H & D Package Laboratory is ready to help you in *any* packaging problem . . . to give packaging that will help increase sales, reduce costs, provide better product protection. For free booklet, "Pack To Attract," write Hinde & Dauch, 5218 Decatur St., Sandusky, Ohio.

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Akron, Baltimore, Battle Creek, Mich., Bloomington, Ill., Buffalo, Chicago, Cincinnati, Cleveland, Columbus, Denver, Detroit, Fairfield, Conn., Findlay, Ohio, Gloucester City, N. J., Greensboro, N. C., Hoboken, Indianapolis, Jamestown, N. Y., Kansas City, Lenoir, N. C., Minneapolis, Omaha, Plymouth, Ind., Reading, Pa., Richmond, Va., Roanoke, Va., Rochester, Sandusky, Ohio, Shrewsbury, Mass., St. Louis, Toledo, Watertown, Mass.

eral different operations is desirable.

Improved Hydraulic Speed Mill

USE REPLY CARD—CIRCLE No. 8

Small parts requiring close limits and fine finish are machined on an improved hydraulic speed mill built by Viking Industries, Rockford, Ill. Construction is strengthened by a 2½-inch round steel overarm that adds rigidity to the cutter arbor. Overarm's outboard end is supported by a heavy adjustable saddle and steel brace that helps assure efficient cutting action and close precision tolerances on heavy-duty work without adding attachments. Infinite, variable spindle speeds are another feature of the redesigned model. Table cycle incorporates infinite cutting feeds, rapid approach and quick return.

. . . overarm adds rigidity to cutting arbor

Two models are available: One is specially designed to handle climb milling jobs; the other, conventional milling work. Both are cabinet units occupying 30 x 32 inches floor space. Maximum cutting length is 7 inches; table traverse adjustment, 13¾ inches; and vertical adjustment, 7½ inches. They accommodate milling cutters to 6 inches diameter.

Telescoping Fork Extension

USE REPLY CARD—CIRCLE No. 9

Raymond Corp., 9189 Madison St., Greene, N. Y., introduces a telescoping fork extension for use on its line of industrial trucks. Fork extension remains on the elevating

*Overcured Sections — present every 30′ to 40′ in all belts made by the flat press method. Only Rotocuring (continuous, non-stop curing) eliminates this major cause of belt failures.

Here Lies a Good Conveyor Belt ...killed by OCS*

—BWH ROTOCURE prevents these fatalities — look for it in the belts you buy

Press overlaps, inherent in belts cured by flat press methods, are a primary cause of early belt failure. The overlaps result in overcured segments 2″ to 4″ wide across the entire belt because vulcanization is *not* continuous. These 2″ to 4″ segments are *double cured* — and *double curing weakens the structure!*

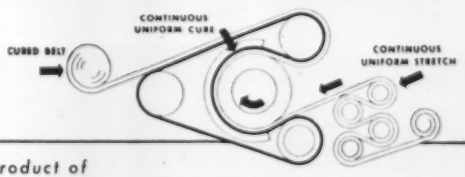
When you buy a BWH conveyor belt made by the *continuous* ROTOCURE process of vulcanization you obtain a *uniformly strong* belt *overall.* The weakened segments due to overlapping that sabotage operations and inflate belting costs are completely eliminated. With continuous, endless vulcanization you'll be ahead four ways:

1. In increased belt flex life — as much as 40%
2. In elimination of mechanical distortion at the press ends
3. In constant, uniform stretch
4. In uniform, abrasion-resistant covers

These characteristics of BWH Conveyor Belts mean minimum belt maintenance costs, longer belt life and appreciable per ton savings in the cost of what you convey! Ask your BWH distributor to show you how these highly serviceable belts can help you. Or write us direct.**

**Ask him also about BWH Rotocured Transmission Belts. Because they permit operation at lower tensions, you are assured of longest possible belt life.

DIAGRAMMATIC SKETCH OF EXCLUSIVE ROTOCURE PROCESS



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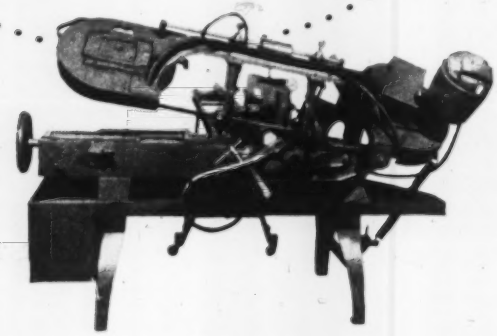
WAREHOUSE STOCK, 111 NORTH CANAL ST., CHICAGO, ILLINOIS

Get the advantages of AUTOMATIC BAR STOCK CUT-OFF at a fraction of the cost you might expect



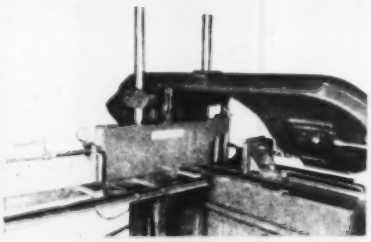
. . . . . with a WELLS SAW and WELLS-O-BAR Feed Master

A set-up for automatic repetitive cutting need not be prohibitively expensive. By combining a Wells Metal Cutting Band Saw and a Wells-O-Bar Feed Master you can automatically cut any quantity of identical lengths of bar stock with a modest investment. Or, a Wells-O-Bar Feed Master can be added to your present horizontal band saw to convert it to an automatic cut-off machine.

For operation the feed unit requires only air at 60 to 80 pounds pressure. Standard feed will project up to 17". The feed mechanism does not interfere with the use of the saw for making single cuts.

See your Wells Dealer for complete information or write direct.

The illustration above shows the Wells-O-Bar unit attached to a Wells No. 8 Saw. At the right is the unit attached to a Wells No. 12 Heavy Duty Machine.



Wells saws

Wells

The Pioneers of Horizontal

METAL CUTTING BAND SAWS

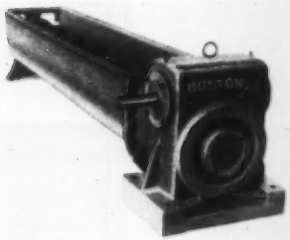
WELLS MANUFACTURING CORPORATION
1515 PILLMORE ST., THREE RIVERS, MICHIGAN

forks at all times, eliminating necessity of attaching when large pallets must be handled. Formed steel channel sections with retaining bar welded underneath fit over regular elevating forks. A locking pin welded to the extension drops into any one of a series of holes drilled in the elevating fork. This makes it possible to extend the fork to several possible lengths. Extensions are made for the company's 2000 and 3000-pound capacity straddle type electric trucks.

Reducer Has Built-in Adapter

USE REPLY CARD—CIRCLE No. 10

Addition to the line of speed reducers made by Boston Gear Works, Quincy 71, Mass., is the model C9-U52, made for application to standard 9-inch diameter screw feed conveyors. Reducer is



. . . applied to 9-inch screw feed conveyors

equipped with a built-in adapter flange for ready installation by direct mounting on the conveyor trough. A separate sub-base assures precise alignment. Installation of special diameter output shafts can be made as optional equipment. Unit is available on special order for other standard conveyor sizes.

Conveyor Rated at 1000 Pounds

USE REPLY CARD—CIRCLE No. 11

Market Forge Co., Everett 49, Mass., offers a lightweight conveyor rated to take loads of 1000 pounds covering the entire surface or individual loads to 300 pounds per unit. Conveyor is 12 inches wide, made in 5 and 10-foot sections with 45 and 90-degree curves to suit individual needs. Ball bearing wheels 2 inches diameter and ⅝-inch wide are spaced on slightly less than 3-inch centers. Conveyor is made with

RESISTS HOT ACETIC ACID and CHLORIDE VAPORS AT 158 TO 284 DEG. F.

HASTELLOY alloy expansion joint

This HASTELLOY alloy C expansion joint is constantly exposed to acetic acid vapors saturated with acetyl chloride and containing small amounts of chloracetic acid. Alloy C is practically unaffected by these corrosive vapors at temperatures of 158 to 284 deg. F. Used at the top of a 24-foot distillation still, the joint is also elastic enough to compensate for the almost half-inch growth of the heated tower.

HASTELLOY alloy C and the other two grades of this nickel-base alloy—alloys B and D—are excellent construction materials for all types of processing equipment that must resist corrosive attack. In addition to their unusual corrosion resistance, alloys B and C have high mechanical strength and are available in both cast and wrought forms. Alloy D is available in cast form only. All three alloys are readily fabricated by most common methods. Fill out the handy coupon below for the whole story on these alloys.

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HAYNES Trade-Mark *Alloys*

Haynes Stellite Company
A Division of
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Haynes Stellite Company, 725 So. Lindsay Street, Kokomo, Indiana

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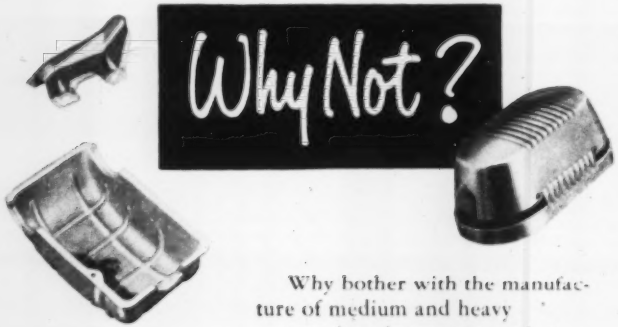

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GEOMETRIC STAMPING CO.

A Subsidiary of Barium Steel Corp.

1130 E. 200th Street Cleveland 17, Ohio

welded-on connectors, interconnectable with a majority of wheel conveyors in the same size. It can also be supplied with the company's removable-type connectors. Lightweight design is retained by using tension members that add no unnecessary weight, e.g., weight of a 10-foot section is 69 pounds.

Eight-Position Tool Holder

USE REPLY CARD—CIRCLE No. 12

Davis Boring Tool Division, Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., offers an eight-position tool holder made for use on vertical boring and turning mills. Tool requires one wrench adjustment to change positions. It enables an operator to turn, undercut, bore and chamfer in one set-up. Four tools can be mounted simultaneously, with positive position maintained by two index pins. Cast steel body of the holder helps assure accuracy. A center pin locks the complete assembly in rigid alignment and clamps it solidly. One adjustment can change position through 360 degrees in accurately-indexed, 45-degree increments.

Fan Uses Airfoil Propellers

USE REPLY CARD—CIRCLE No. 13

Heavy duty direct drive fan made for industrial application, duct work, mine exhaust systems and filtering units is introduced by Chelsea Fan & Blower Co. Inc., Plainfield, N. J. Used where large volumes of air are needed under static pressure, the fan is equipped with nonoverloading, cast aluminum airfoil propellers. Motors are totally enclosed, ball bearing. Sizes from 16 to 48 inches and air deliveries from 2900 to 37,000 cfm are available.

Low Lift Truck and Crane

USE REPLY CARD—CIRCLE No. 14

Combination low lift platform truck and crane, introduced by Elwell-Parker Electric Co., 4205 St. Clair Ave., Cleveland 3, O., can be used for plant maintenance or handling production materials not suited to conventional techniques. Truck has standard 4000-pound capacity, self-loading platform to lift and transport skids and a power winch for pulling heavy loads on

man with a future

Here's a youngster who's going to be somebody's customer thirty years from now. He is going to need products, services, finished goods and raw materials no matter whether he is a doctor, lawyer, butcher, baker or manufacturer.

This young fellow is our business. He is yours too. Just reach thirty years back and you'll see the future thirty years from now.

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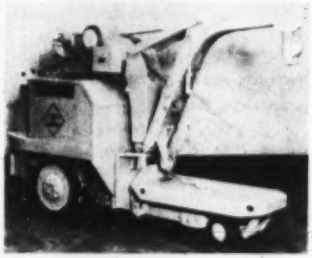
... use them to save time, trouble and money!

or off the platform. Boom swivels 180 degrees, hoisting loads weighing a maximum 2000 pounds.

Electric storage battery or gas-electric units supply individual motors that power drive, platform lift, winch and hook. Winch, platform and hook can be controlled from both the operator's position and



. . . for maintenance or difficult handling

the load end by remote control switch located on the boom. Design provides two-wheel drive and four-wheel steering. Models are available with fixed or movable booms. Maximum hook height is 57 inches; outreach, 61 inches. Platform height is 10-7/16 inches.

Portable Loading Platform

USE REPLY CARD—CIRCLE No. 15

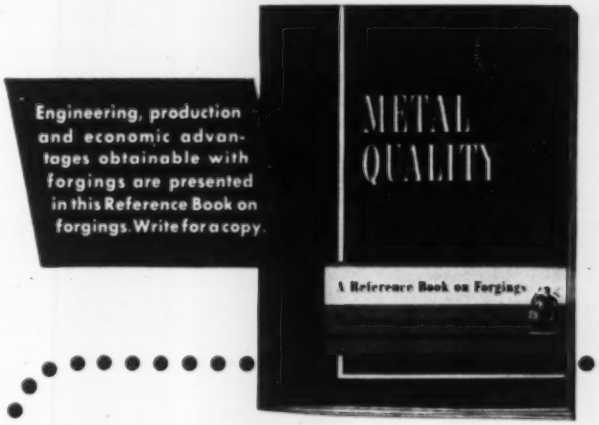
Capacity of 1 to 3 tons and maximum 20-foot range are features of a portable loading platform introduced by Atlas Industrial Corp., 849 39th St., Brooklyn 32, N. Y. Standard platform is 4 x 4 feet, but other sizes are available to meet requirements. Retractable casters are included to ease moving to desired location. Loader is operated electrically by one man, using either floor or platform control or both. All welded steel construction indicates satisfactory life in rugged use.

Desk Records 96 Readings

USE REPLY CARD—CIRCLE No. 16

Console desk developed by Brown Instruments Division, Minneapolis-Honeywell Regulator Co., Philadelphia 44, Pa., makes it possible for one operator to obtain plant temperature readings from 96 processing points. These readings can be indicated in about one per second while the operator is seated at the desk.

Console is a 60-inch wide steel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A Reference Book on Forgings

Never underestimate the preference of users of your product for the factor of greater safety that is inherent in forgings. This factor of greater safety results from toughness and strength, in correct proportion, as found only in closed die forgings. Consult a forging engineer about the mechanical properties required for your product.

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Please send 60-page booklet entitled "Metal Quality — How Hot Working Improves Properties of Metal", 1949 Edition.

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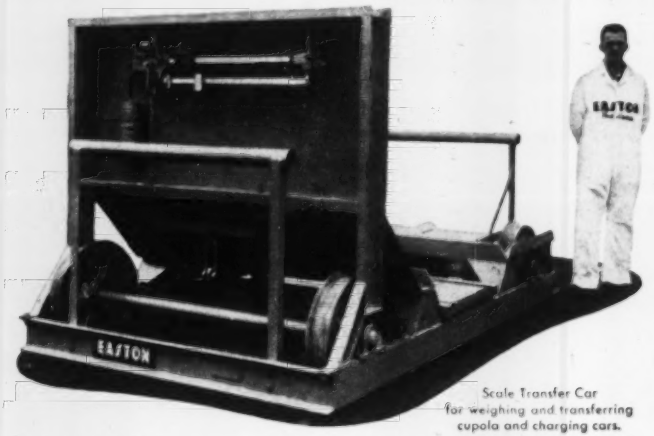

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desk arranged with cutout to accommodate the company's ElectroniK precision indicator and key switch banks or pushbutton assemblies. It has drawers in conventional arrangement, left and right hand slides, center drawer with utility tray. Fixture is applicable to any large industrial control room and can be used with single, multiple or colorgraphic panel board.

Prevents Motor Reversal

USE REPLY CARD—CIRCLE No. 17

U. S. Electrical Motors Inc., Los Angeles 54, Calif., announces a Ballomatic backstop for vertical motors. When motor starts, centrifugal force throws hardened steel balls out of engagement with a stationary member. When motor stops, gravity pulls balls down and one of them engages between rotating member and stationary ratchet, thus preventing motor reversal.

Germanium Rectifiers

USE REPLY CARD—CIRCLE No. 18

General Electric Co.'s Light & Rectifier Department, Schenectady 5, N. Y., has developed a line of industrial rectifiers made of germanium. Models produced include those in single phase, half wave ratings of 12 v/0.4 amp; 21 v/0.4 amp; 27 v/0.4 amp and 6 v/6 amp. Units are designed for power conversion applications where size and weight requirements are at a premium.

Treatment for Aluminum

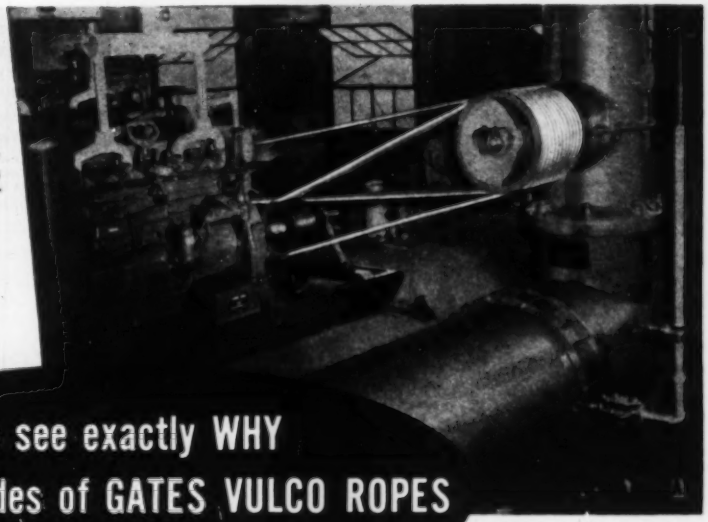
USE REPLY CARD—CIRCLE No. 19

Starcote, announced by Silver Star Chemical Corp., New York 13, N. Y., is a conversion treatment for aluminum and its alloys. It features corrosion resistance and perfect organic coating adherence. Work may be handled in iron containers or racked. Material can be applied by dipping or by an alkaline washing machine on a production line basis.

Stain Resistant Masking Tape

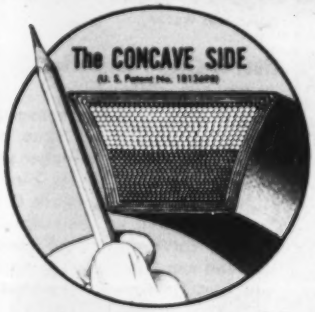
USE REPLY CARD—CIRCLE No. 20

No. 115 stain resistant masking tape, offered by Behr-Manning Corp., Troy, N. Y., is designed for use on lacquered, enameled, painted and porcelain surfaces where



To drive one of the new high capacity pumps which removes surface water and runoff from 15,000 acres of Illinois farmland, members of the District Board chose Gates Vulco Ropes, running from two diesel units.

Let's see exactly WHY the Concave Sides of GATES VULCO ROPES mean lower V-Belt Costs!



Every engineer knows how a V-belt *changes shape* when it bends around a pulley.

The top of the belt is under tension—making it grow *narrower.*

The body is under *compression,* causing the sides to bulge out!

Look at figure 1-A in the diagrams, herewith. There you see how a *straight sided* V-belt is forced to bulge in its sheave-groove—and this bulging naturally causes extra wear along the middle of the sides as indicated by the arrows.

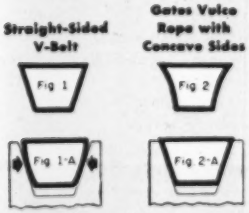
Now look at the figure 2-A. There you see how the precisely engineered Concave Sides fill out to an exact fit in the sheave groove.

Clearly, the Concave Sides press *evenly* against the V-pulley. This means uniform wear; longer life! The Concave Sides have *full traction;* wear longer because of *full contact!*

To sum up: The Concave Sides of Gates Vulco Ropes (U.S. Patent No. 1813698) give you (1) Less wear, (2) More pulley contact, (3) More sure power transmitted when needed!

Only V-belts made by Gates are built with concave sides. Whenever you buy V-Belts, be sure you get the V-Belt with the Concave Sides—The Gates Vulco Rope!

What Happens When a V-Belt Bends



How Straight-Sided V-Belt Bulges in Sheave-Groove. Sides Press Unevenly Against V-Pulley Causing Extra Wear At Point Shown by Arrows.

The Concave Sides Fill out to a Precise Fit in the Sheave Groove. No Side Bulge! Sides Press Evenly Against the V-Pulley—Uniform Wear—Longer Life!

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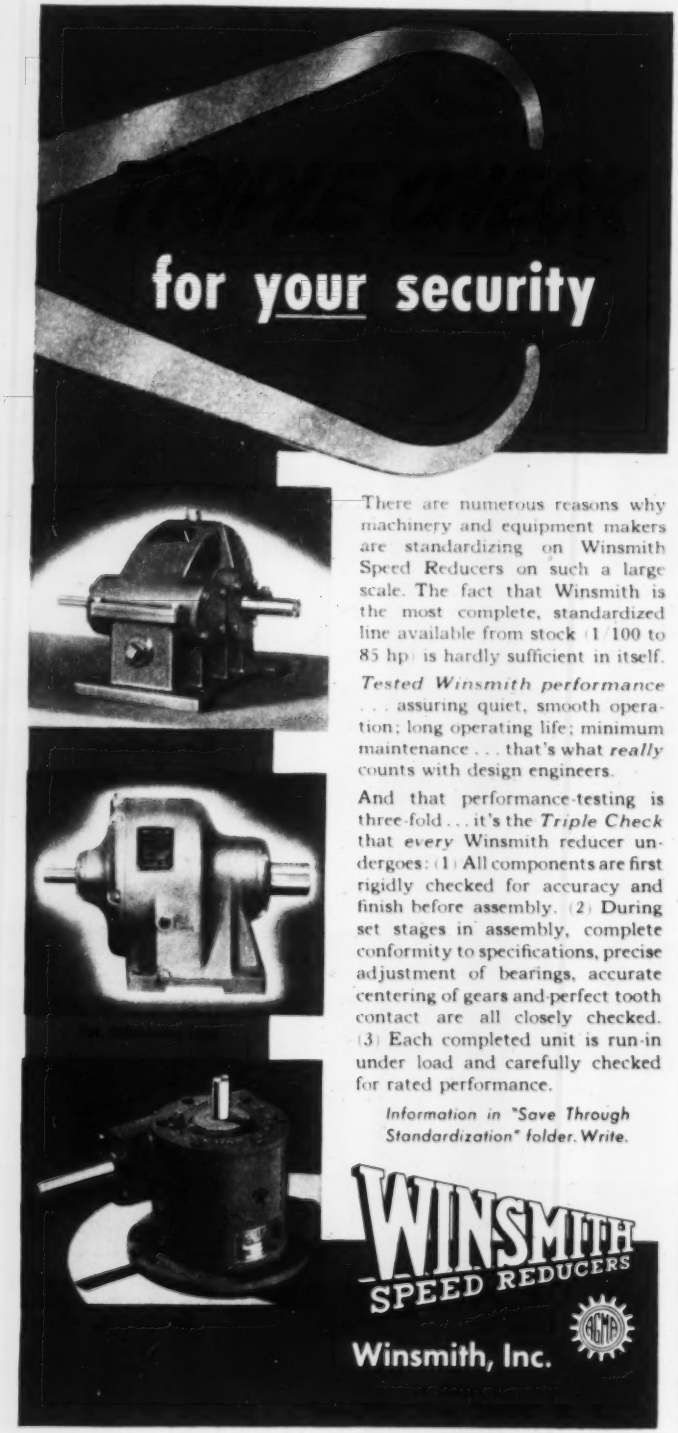

for your security
There are numerous reasons why machinery and equipment makers are standardizing on Winsmith Speed Reducers on such a large scale. The fact that Winsmith is the most complete, standardized line available from stock (1/100 to 85 hp) is hardly sufficient in itself.
Tested Winsmith performance . . . assuring quiet, smooth operation; long operating life; minimum maintenance . . . that's what really counts with design engineers.
And that performance-testing is three-fold . . . it's the Triple Check that every Winsmith reducer undergoes: (1) All components are first rigidly checked for accuracy and finish before assembly. (2) During set stages in assembly, complete conformity to specifications, precise adjustment of bearings, accurate centering of gears and perfect tooth contact are all closely checked. (3) Each completed unit is run-in under load and carefully checked for rated performance.
Information in "Save Through Standardization" folder. Write.
WINSMITH
SPEED REDUCERS
Winsmith, Inc.

color separation, masking, packaging and holding functions are required. It is particularly effective on white, off-white and light pastel colored surfaces where chemical reaction usually has a tendency to stain.

Floor Surface Reinforcement

USE REPLY CARD—CIRCLE No. 21

Acme Steel Co., Chicago, Ill., offers Floor Plate, an $11\frac{3}{4}$-inch square plate of 0.068-inch hot rolled steel designed for reinforcement and protection of concrete floor surfaces that are subjected to heavy industrial loads. It can be installed as a new floor surface or over old floors.

Plastic Spray Booth Material

USE REPLY CARD—CIRCLE No. 22

A vinyl-type paint spray booth coating material called Vincote, is offered by Detrex Corp., Detroit 32, Mich. It was developed for use on side walls of both water-wash and dry paint spray booths. It is impervious to paint, enamel, lacquer and water.

Electric-Circuit Controller

USE REPLY CARD—CIRCLE No. 23

Regohm, a device for converting low power-level signals into control signals of a much higher power level is available from Electric Regulator Corp., S. Norwalk, Conn. The plug-in unit can be utilized in voltage, current or speed regulation and can be adapted to important functions in servo systems.

Ceramic Trimmer Capacitors

USE REPLY CARD—CIRCLE No. 24

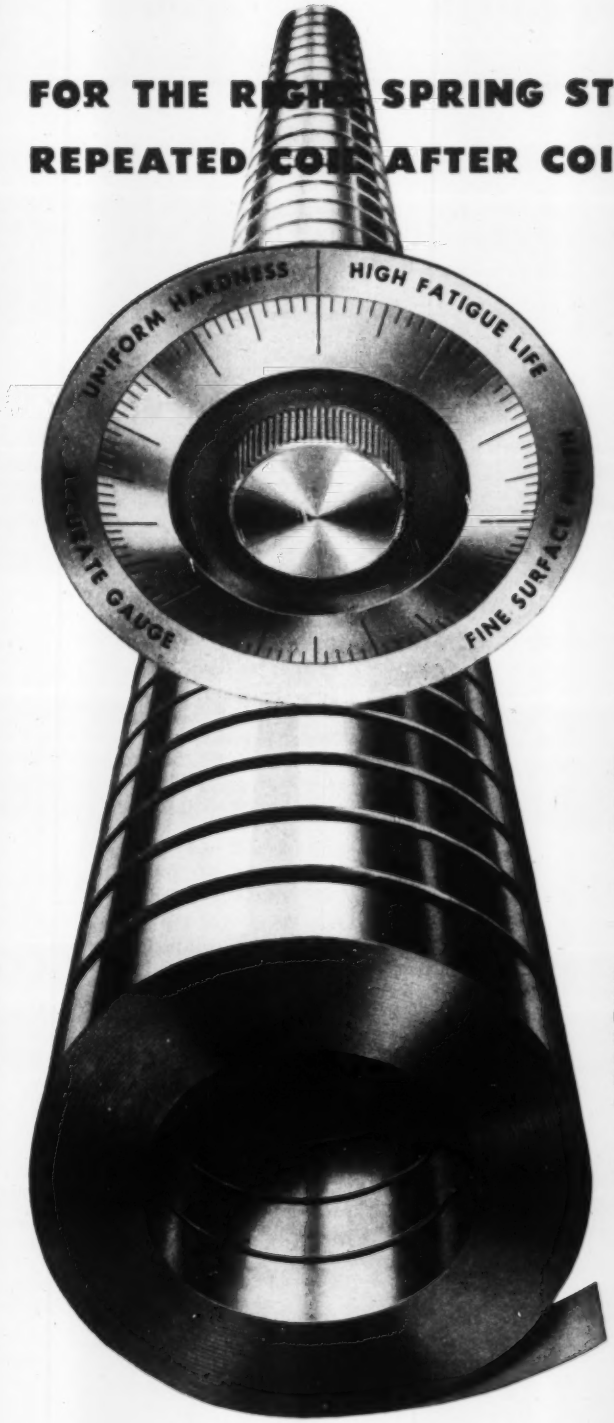
Ceramic trimmer capacitors for use in circuit applications where maximum stability of capacitor characteristics is of importance, are introduced by Herlee Corp., Milwaukee, Wis.

Prevents Water Staining

USE REPLY CARD—CIRCLE No. 25

A chemically treated interleaving tissue paper to prevent water staining during storage of aluminum flat sheet products is announced by Kaiser Aluminum & Chemical Corp., Oakland 12, Calif. It serves as a cushion against abrasion, but is also treated with a chemical inhibitor compound that

FOR THE RIGHT SPRING STEEL COMBINATION
REPEATED COIL AFTER COIL...



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Sandvik cold-rolled strip steels are supplied:

- **Precision rolled in thicknesses from .001"**
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- **Annealed, unannealed or hardened and tempered**
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Phone, write or wire your nearest Sandvik office for further information or technical help.

FREE!

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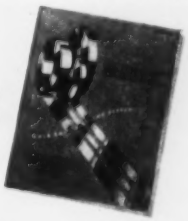
Write, on your letterhead, for your copy, today.



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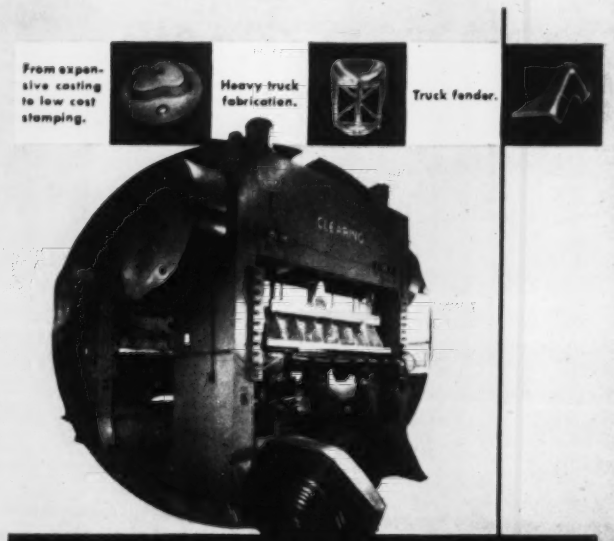
Sandvik Quality Steels

SS-67



NO GAME OF CHANCE . . .

Getting the best from presses is an operator's stock in trade in the contract stamping business. Competition is keen, and successful old timers, like Briskin Mfg. Co., Chicago, didn't get that way without a great deal of production skill.

Briskin put their money on Clearing presses because Clearings gave them the maximum quality, economy, on-schedule production and minimum waste that are the watchwords of Briskin production. Die regrinds are few and far between and maintenance costs are lower, too.

Where competition is tough and economical production means a winning hand, Clearing presses are dependable assets. Looking at results is a good way to choose *your* press equipment too! For production, your best choice is Clearing.

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HAMILTON DIVISION, HAMILTON, OHIO

CLEARING PRESSES

THE WAY TO EFFICIENT MASS PRODUCTION

eliminates water staining that takes place between stacked sheets of most metals and many non-metals.

Small Cam Valve

USE REPLY CARD—CIRCLE No. 26

A small cam operated valve is announced by Ross Operating Valve Co., Detroit 3, Mich. It is a ¼-inch, four-way valve with a long lever. Lever travel is less than 1 inch. No. 636 is suitable for low volume applications requiring a mechanically operated valve.

Process Eliminates Buffing

USE REPLY CARD—CIRCLE No. 27

Hanson-Van Winkle-Munning Co., Matawan, N. J., introduces a silver plating process that makes it possible to obtain bright silver plate without buffing or scratch brushing. Known as Silver-Lume, the process may be operated over a wide range of current densities.

Clamps for Large Planers

USE REPLY CARD—CIRCLE No. 28

Clamps for large planers are available from J & S Tool Co., E. Orange, N. J. Called Jumbo and Lil-Giant clamps, they allow loading and unloading by loosening one adjusting screw. All are equipped with T-nuts to fit all large standard planers and with varying nose-grips for special requirements.

Indicates Elongation in Testing

USE REPLY CARD—CIRCLE No. 29

Extensometer, developed by National Forge & Ordnance Co., Warren County, Pa., indicates the elongation of metallic and plastic specimens in tension testing directly without a multiplying lever. It attaches to the specimen by spring clamps which are opened or closed while it is held in the hand. Device adjusts to take wire, sheet,

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71. Portable Electric Tools

Black & Decker Mfg. Co.—20-page illustrated 1952 catalog No. 10 gives you all the necessary information on line of portable electric tools, including drills and their stands and attachments, screw drivers, glue pots, reels, sanders, grinders, vacuum cleaners, saws, hammers, valve and tool grinders and brushes.

72. Gage Blocks & Accessories

DoALL Co.—Comprehensive 24-page illustrated catalog "Gage Blocks and Accessories for Modern Measurement Control" contains descriptive matter that explains measuring with gage blocks and light wave interference bands. Much of information presented is of a basic nature.

73. Portable Lift Equipment

Hamilton Tool Co.—"Seven Spheres of Portelvator Influence" is title of pocket-size folder which illustrates part Portelvator platform lifting trucks and carts can play in traffic control, materials handling, safety, maintenance, machine down time, storage and assembly.

74. Qualities of Wrought Iron

A. M. Byers Co.—"Proof by Performance" is 8-page pictorial study of applications of genuine wrought iron in service and describes in non-technical manner a number of installations in which metal gives outstanding service over long periods of time.

75. Solenoid Air Valve

Bellows Co. — How fast, positive control of air is afforded by the Bellows Electrovalve is explained in 6-page illustrated folder AV-200. This packaged control consists of a four-way directional slide valve, solenoid controls and integral speed regulators. Tiny 8-v solenoids merely direct the full pressure of incoming air to the work of shifting the slide valve.

76. Nonferrous Castings

Atlantic Casting & Engineering Corp.—Together with short history of company, 12-page illustrated booklet "High Quality Precision Castings for Industry" explains how Atlantalloy plaster mold casting process affects savings in material, grinding and machining of cast parts. Process is shown step by step, from preparation of die patterns to inspection of products.

77. Hardfacing Electrodes

American Brake Shoe Co., American Manganese Steel Div.—It is a simple matter to select the proper hard facing rod for any given job with 17 x 26-in. wall chart. This reference guide divides welding into basic operations under which are listed the recommended rod, available sizes and preferred method of application.

78. Transportation Equipment

Easton Car & Construction Co.—Photographs and brief specifications of great variety of industrial transportation and handling equipment are included in catalog 2. Included are off-highway trailers and truck bodies, mine and quarry cars, rocker dump cars and trailers, electric industrial trucks and heavy duty intraplant trailers.

79. Corrosion Resistant Floors

U. S. Stoneware Co. — "How To Build Corrosion Resistant Floors" is title of 16-page bulletin AB-17. It describes uses of acid brick, application of different types of cement, shows drawings of various floor types and has actual installation photos.

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80. Steam Cleaner

Clayton Mfg. Co.—Although this illustrated 4-page form C-345 details use of Kerrick-Kleaner steam cleaning unit in a Southern restaurant, you should be able to pick out many industrial applications from reading it. Machine cleans stainless steel, masonry and floors and reaches hard-to-get-at places.

81. Hydraulic Presses

E. W. Bliss Co.—Here's a new 36-page catalog, No. 30-A, containing descriptive and illustrative information on line of Hydro-Dynamic presses. Sections are devoted to single-action housing and open-rod presses, double-action housing and open-rod presses, special function presses, materials handling devices and hydraulic cushions.

82. Large Blowers

Allis-Chalmers Mfg. Co.—Construction and application data on multi-stage type V centrifugal blowers for equivalent air pressures above 6.5 psig and inlet volumes above 1500 cfm are presented in 6-page illustrated bulletin 19B6104A. If it's large volumes of air or gas that's needed, get this one.

83. Planers

Cleaving Machine Corp., Hamilton Div.—6-page illustrated bulletin 501 has general information and descriptions of features incorporated in line of Martin planers. Features include independent electric feeds, stationary screws, and double-balanced gear train.

84. Rotary Pumps

De Laval Steam Turbine Co., Standard Products Div.—Descriptions, applications and uses of A313B IMP rotary pumps are included in 4-page illustrated bulletin L313B. General service screw type pump for handling petroleum products and other light viscous fluids is offered with capacities to 80 gpm, pressures to 275 psi (continuous) and 325 psi (intermittent). Viscosity tables and dimensions are included.

85. Metal Conveyor Belts

Ashworth Bros. Inc., Metal Products Div.—Whether it's hot, cold heavy or light, there's a type and size of Ashworth metal conveyor belt to handle it. For complete working data to aid in design application and selection, catalog No. 81 is yours for the asking. Available weaves, materials, sizes and capacities are tabulated in ready reference form.

86. Spectrometer

Baird Associates, Inc.—"The Direct Reader for Better Analytical Control of Alloys" is title of informative bulletin XXXIV which describes the Baird Associates-Dow direct reading spectrometer. This instrument gives precise analysis in 5 minutes.

EDITORIAL REPRINTS:

87. Metalworking Data

Available to STEEL readers in reprint form is 48-page fourth edition of "Metalworking Facts & Figures" which tabulates latest statistics. Contents trace raw materials through to the end products of metal-consuming industries. Related subjects such as labor, prices and earnings are covered as well.

88. Strip Handling Methods

Many methods lend themselves to speedier processing of both coiled and sheared steel strip. Handling costs as well as waste and scrap losses drop when using the right machines. If you care to know more about these methods and machines send for illustrated reprint entitled "More Zip for Strip Handling" taken from Feb. 15 issue of STEEL.

89. Reducing Tooling Costs

Have your tooling costs skyrocketed because of the rising demand for jigs and tools to help unskilled labor produce acceptable finished parts? If so, you'll be interested in one British equipment designer's methods for reducing costs, which include using steel shapes for clamps, bodies and attachments, welding of components, and using fasteners, cold rolled steel bars and drill rod. Request Feb. 15 STEEL reprint entitled "Tooling Can Be Cheaper."

90. Metalworking Destiny

Reprint entitled "Metalworking's Destiny" forcefully points to the gradual loss of industry's most valuable asset—the incentive to produce. Editorial, however, optimistically sets forth broad, far-reaching steps nation must take to restore this incentive and to realize its industrial destiny.

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plate or round specimens up to a maximum thickness or width of ½-inch. Standard gage length is 2 inches.

Spring-Action Load Binders

USE REPLY CARD—CIRCLE No. 30

Load binders, developed by Canton Cast Products Co., Canton 5, O., feature the compensating action of a sturdy spring. Four models in production begin at 9000-pound capacity.

Cleaner and Neutralizer

USE REPLY CARD—CIRCLE No. 31

Planisol, developed by Patterson Wells Corp., Madison, N. J., makes it possible to clean and neutralize with the same solution. Solution removes all oil and grime without an accumulation of sludge on the cleaning tank bottom. Speedy wetting and free-rinsing qualities allow surfaces to dry instantly.

Cuts Steel Deburring Time

USE REPLY CARD—CIRCLE No. 32

Blue Magic Chemical Specialties Co., Philadelphia 24, Pa., has developed a deburring and barrel finishing compound. No. S-12 compound is said to reduce deburring time and produce uniform radii on parts such as bearing races and retainers. It is also a good temporary rust inhibitor.

Improved Milling Cutter

USE REPLY CARD—CIRCLE No. 33

Style KF Kennamill, designed for steel production milling runs where adequate horsepower is available and where intermittent or narrow cuts are encountered, is announced by Kennametal Inc., Latrobe, Pa. Blades are interchangeable in all slots of any size of cutter body of the same type. It is made in four cutting diameters: 6, 8, 10 and 12 inches.

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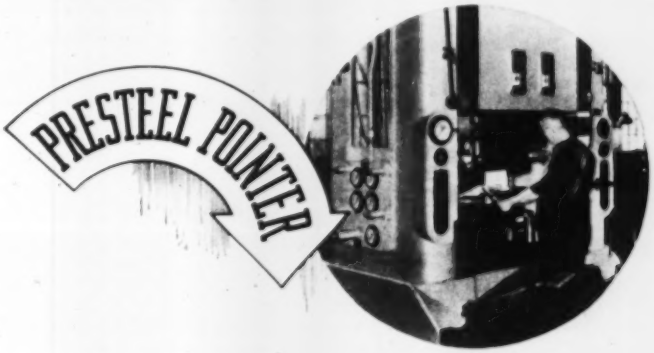

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ELECTROMET Data Sheet

A Digest of the Production, Properties, and Uses of Steels and Other Metals

Published by Electro Metallurgical Company, a Division of Union Carbide and Carbon Corporation, 30 East 42nd Street, New York 17, N. Y. • In Canada: Electro Metallurgical Company of Canada, Limited, Welland, Ontario

VANADIUM...the metal that accentuates the effects of other alloying elements

Vanadium is usually added to steel or iron along with other alloying metals, such as manganese, tungsten, nickel, or chromium. It enhances the effect of these other alloys and helps to improve the physical properties of the metal. Generally it is used in quantities of less than 0.50 per cent, but even in these small amounts it is responsible for many marked improvements in the quality of iron and steel.

One of the most notable functions of vanadium is its effect in improving the dynamic properties of steel, such as fatigue and impact resistance. It also gives an inherently fine grain size to both steel and iron.

In high-speed tools, vanadium contributes wear resistance and red hardness. It is also an important alloy in many types of permanent magnet steels. These and many other types of special-purpose steels contain more than 0.50 per cent vanadium to enhance certain properties.

Dynamic Strength for Steels

The principal effect of vanadium in engineering steels is that of refining grain size. It is usually added in amounts of 0.10 to 0.25 per cent.

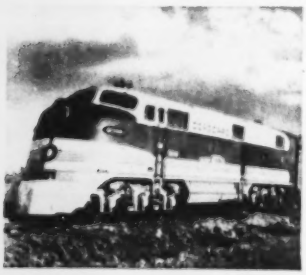


Fig. 1. Steels in which vanadium is an alloy have outstanding dynamic strength. That is why they are frequently used in such heavy-duty service as springs and axles in diesel locomotive trucks.

In the lower carbon ranges, vanadium steels are especially suited for carburizing and are used for such applications as hand tools, bearings, and pistons. Vanadium-bearing steels can also be nitrided effectively.

Vanadium contributes fatigue and impact resistance and also strength and ductility to spring steels. The famous chromium-vanadium (SAE 6100 series) and manganese-vanadium spring steels are outstanding examples of this use. Besides being used as springs, these steels are frequently used for axles, shafts, and other highly stressed moving engine parts.

Red Hardness in Tools

Practically all fine tool steels contain vanadium. In high-speed steels, vanadium content usually ranges from about 0.50 to 2.50 per cent, although higher percentages are sometimes used. Other alloy tool steels usually contain from 0.20 to 1.00 per cent vanadium.

Vanadium is a strong carbide-former and forms very hard and stable carbides. These vanadium carbides are probably the main reason for the excellent wear resistance and edge-holding properties of vanadium tool steels. The persistence of the vanadium carbides is largely responsible for the cutting qualities at red hardness of high-speed tool steels.

Adds Strength to Cast Iron

In amounts of 0.10 to 0.15 per cent, vanadium increases the strength of cast iron from 10 to 25 per cent, and adds a considerable amount of toughness. Cast iron containing vanadium is especially valuable in such applications as steam locomotive cylinders, valve and piston bushings, piston rings, and similar parts. In steam engines and diesel motors, vanadium cast iron cylinders greatly outlast those of ordinary cast iron. Chromium-vanadium cast iron rolls, containing up to 2 per cent chromium, have been used successfully in steel mills for a great many years.

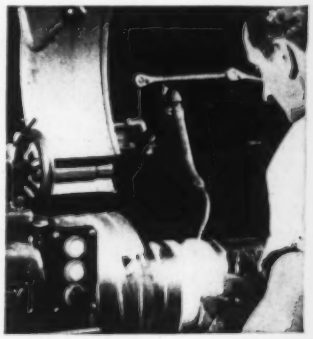


Fig. 2. Nearly all fine tool steels contain vanadium. It promotes fine grain size, high wear resistance, and greater control of hardenability. Vanadium also contributes to the red hardness of high-speed tool steels.

Cast iron in which vanadium is the sole alloying element is used primarily in applications where temperatures are moderately high and in heavy sections requiring uniform hardness without brittleness.

ELECTROMET Vanadium Alloys

ELECTROMET produces three grades of ferrovanadium in various sizes for the production of vanadium-bearing steels and irons. Each grade has a definite range of carbon and silicon contents and is especially adapted to assure the best results in the different requirements of iron and steelmaking.

Write for a copy of the booklet, "ELECTROMET Products and Service." It contains many useful facts about the use of ferrovanadium. The booklet also describes over 50 other alloys and alloying metals produced by ELECTROMET.

The term "Electromet" is a registered trademark of Union Carbide and Carbon Corporation.

The Market Outlook

LATE SECOND quarter looms as the testing period for steel. Unless the downtrend in demand for certain products, such as sheets and strip, is reversed by that time you can expect some slackening in steelmaking operations. That's the way the steel men view the outlook today. This is particularly true of the smaller steelmakers, but it also applies to the large, integrated interests in considerable measure. All of them are apprehensive for the last half of the year. Arbitrary government restrictions on consumption of steel and other metals by consumer durable goods makers are beginnng to really hurt. The growing slack from that direction is not being taken up by increasing defense requirements.

CONTROLS—Almost as a unit, steelmakers insist government controls on consumption must be lifted soon if a noticeble slowing down in steel is to be averted. With new steelmaking facilities coming into the picture steadily they are increasingly apprehensive of glutted markets later this year in those items already under ensier demand pressure. Only through lifting of consumption controls do they see any hope for early relief for this threatening situation. Further decontrol, such as recently effected on chrome stainless steels, is certain. But it likely will be piecemeal. Government officials are adamant in their insistence general decontrol will not come soon.

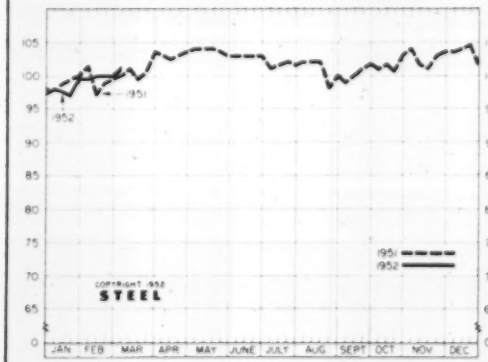
SLACKENING—Current high-level activity in the steel industry can be misleading. Only here and there are any clear-cut effects of slower demand in evidence as yet. But underneath the surface of the market danger signs are appearing. The warehouses are having more difficulty moving certain products and in some cases are declining shipments from mills. There is a noiceable increase in mill order cancellations and shipment deferments. The easier tone of the scrap market is seen as a warning finger pointing to things to come. Scrap, traditional barometer for steel, is being watched closely. While supplies of steelmaking grades of scrap still are critically low, there is noticeable easing in demand pressure for material on the part of some mills. This is reflected in the greater selectivity being exercised in accepting shipments. Price cutting on the cast iron grades of scrap largely reflects the slowing down in foundry requirements and the flood of tonnage arising from accelerated auto graveyard shipments.

DEMAND—Practically all of the mills are fairly well committed into second quarter. This applies to the small as well as the large producers. However, the nonintegrated interests are in less favorable position. Many of these producers have been quoting premium prices and are first to feel the effects of slackening demand as space in rolling schedules becomes available from the larger interests. Already this is resulting in the elimination of overtime at some small mills, return of more competitive pricing and more intensified selling effort than for a long time past. These small producers operate to best advantage in periods of peak demand. Right now they see trouble ahead, though consumption still looms large as indicated by the fact many consumers' requirements are restricted by lack of authorized Controlled Materials tickets. In this connection, it is significant that NPA is increasing supplemental allotments for first and second quarters in certain instances.

CAPACITY—Survey just completed by STEEL shows steelmaking capacity as of Jan. 1, 1952 was 108,542,870 net tons of ingots, increase of 4,503,064 tons over Jan. 1, 1951. Projected expansion this year will raise ingot capacity in 1953 to 119,450,431 net tons. At the same time, blast furnace capacity as of Jan. 1 was 73,412,998 tons, increase over a year ago of 1,001,738 tons. Projected blast furnace expansion over coming months will raise capacity to 80,688,198 tons. Additional finishing facilities also are on the way.

PRODUCTION—The steel mills boosted operations 1 point last week to 101 per cent of capacity. This is a new high rate based on the industry's expanded facilities as of the beginning of this year.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Mar. 1	Change	Same Week 1951	Same Week 1950
Pittsburgh	104	+ 2*	101	52
Chicago	103	+ 0.5*	103.5	86.5
Mid-Atlantic	98	0	99.5	61
Youngstown	105	+ 3	101	50
Wheeling	100.5	0*	96	89
Cleveland	95	— 3.5	102	93.5
Buffalo	104	0	104	93.5
Birmingham	104	0	100	55
New England	82	— 6	90	80
Cincinnati	89	0	108	89
St. Louis	85.5	+ 17	87	84.5
Detroit	101.5	0	108	98
Western	106	0	101.5	81
Estimated national rate	101	+ 1	100	69

Based on weekly steelmaking capacity of 2,082,617 tons in 1952; 1,999,034 tons for 1951; 1,928,721 tons for second half, 1950; 1,906,268 tons for first half, 1950.

*Change from revised rate for preceding week.

The Metalworking Outlook—p. 39 Production-Engineering News—p. 75

Composite Market Averages

FINISHED STEEL INDEX, Weighted:

	Feb. 28 1952	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av. = 100)	171.92†	171.92†	171.92†	171.92	118.67
Index in cents per lb.	4.657†	4.657†	4.657†	4.657	3.215

ARITHMETICAL PRICE COMPOSITES:

Finished Steel, NT	$106.32†	$106.32†	$106.32†	$106.32	$69.73
No. 2 Fdry. Pig Iron, GT	52.54	52.54	52.54	52.54	30.17
Basic Pig Iron, GT	52.16	52.16	52.16	52.16	29.56
Malleable Pig Iron, GT	53.27	53.27	53.27	53.27	30.79
Steelmaking Scrap, GT	43.00	43.00	43.00	44.00	34.33

Weighted finished steel index based on average shipments and Pittsburgh district prices of the following 14 representative products during 5-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

† Preliminary.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	Feb. 28 1952	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	3.70	3.70	3.70	3.70	2.60
Bars, H.R., Chicago	3.70	3.70	3.70	3.70	2.60
Bars, H.R., del. Philadelphia	4.223	4.223	4.223	4.18	2.98
Bars, C.F., Pittsburgh	4.55	4.55	4.55	4.55	3.20
Shapes, Std., Pittsburgh	3.65	3.65	3.65	3.65	2.50
Shapes, Std., Chicago	3.65	3.65	3.65	3.65	2.50
Shapes, del. Philadelphia	3.918	3.918	3.918	3.90	2.64
Plates, Pittsburgh	3.70	3.70	3.70	3.70	2.65
Plates, Chicago	3.70	3.70	3.70	3.70	2.65
Plates, Coatesville, Pa.	4.15	4.15	4.15	4.15	2.80
Plates, Sparrows Point, Md.	3.70	3.70	3.70	3.70	2.65
Plates, Claymont, Del.	4.15	4.15	4.15	4.15	2.80
Sheets, H.R., Pittsburgh	3.60-75	3.60-75	3.60-75	3.60-75	2.50
Sheets, H.R., Chicago	3.60	3.60	3.60	3.60	2.50
Sheets, C.R., Pittsburgh	4.35	4.35	4.35	4.35	3.20
Sheets, C.R., Chicago	4.35	4.35	4.35	4.35	3.20
Sheets, C.R., Detroit	4.55	4.55	4.55	4.55	3.35
Sheets, Galv., Pittsburgh	4.80	4.80	4.80	4.80	3.55
Strip, H.R., Pittsburgh	3.75-4.00	3.75-4.00	3.75-4.00	3.75-4.00	2.50
Strip, H.R., Chicago	3.50	3.50	3.50	3.50	2.50
Strip, C.R., Pittsburgh	4.65-5.35	4.65-5.35	4.65-5.35	4.65-5.35	3.20
Strip, C.R., Chicago	4.90	4.90	4.90	4.90	3.30
Strip, C.R., Detroit	4.85-5.60	4.85-5.60	4.85-5.60	4.35-5.60	3.35
Wire, Basic, Pittsburgh	4.85-5.10	4.85-5.10	4.85-5.10	4.85-5.10	3.425
Nails, Wire, Pittsburgh	5.90-6.20	5.90-6.20	5.90-6.20	5.90-6.20	4.125
Tin plate box, Pittsburgh	$8.70	$8.70	$8.70	$8.70	$5.75

SEMIFINISHED

Billets, forging, Pitts. (NT)	$66.00	$66.00	$66.00	$66.00	$50.00
Wire rods, ½-⅝", Pitts.	4.10-30	4.10-30	4.10-30	4.10-30	2.675

PIG IRON, Gross Ton

Bessemer, Pitts.	$53.00	$53.00	$53.00	$53.00	$31.00
Basic Valley	52.00	52.00	52.00	52.00	30.00
Basic, del. Phila.	56.61	56.61	56.61	56.39	32.01
No. 2 Fdry., Pitts.	52.50	52.50	52.50	52.50	30.50
No. 2 Fdry., Chicago	52.50	52.50	52.50	52.50	30.50
No. 2 Fdry., Valley	52.50	52.50	52.50	52.50	30.50
No. 2 Fdry., del. Phila.	57.11	57.11	57.11	56.89	32.51
No. 2 Fdry., Birm.	48.88	48.88	48.88	48.88	26.88
No. 2 Fdry., Birm., del. Cin.	55.49	55.49	55.49	55.38	31.75
Malleable, Valley	52.50	52.50	52.50	52.50	30.50
Malleable, Chicago	52.50	52.50	52.50	52.50	30.50
Charcoal, Lyles, Tenn.	66.00	66.00	66.00	66.00	37.50
Ferromanganese, Etna, Pa.	188.00	188.00	188.00	188.00	140.25*

* F.o.b. cars, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)

No. 1 Heavy Melt., Pitts.	$44.00	$44.00	$44.00	$45.00	$35.00-.50
No. 1 Heavy Melt., E. Pa.	42.50	42.50	42.50	43.50	33.50
No. 1 Heavy Melt., Chicago	42.50	42.50	42.50	43.50	32.50
No. 1 Heavy Melt., Valley	44.00	44.00	44.00	45.00	33.00
No. 1 Heavy Melt., Cleve.	43.00	43.00	43.00	44.00	32.50
No. 1 Heavy Melt., Buffalo	43.00	43.00	43.00	44.00	33.00
Rails, Rerolling, Chicago	52.50	52.50	52.50	52.50	38.50
No. 1 Cast, Chicago	49.00*	49.00*	49.00*	49.00*	42.50

* F.o.b. shipping point.

COKE, Net Ton

Beehive, Furn. (Connsv.)	$14.75	$14.75	$14.75	$14.75	$8.75-$9
Beehive, Fdry. (Connsv.)	17.50	17.50	17.50	17.50	9.75-11.00
Oven, Fdry., Chicago	23.00	23.00	23.00	21.00	15.10

NONFERROUS METALS

Copper, del. Conn.	24.50	24.50	24.50	24.50	19.50-20.50
Zinc, E. St. Louis	19.50	19.50	19.50	17.50	10.50
Lead, St. Louis	18.50	18.50	18.50	16.80	12.80
Tin, New York	121.50	121.50	121.50	182.00	70.00
Aluminum, del.	19.00	19.00	19.00	19.00	15.00
Antimony, Laredo, Tex.	50.00	50.00	50.00	42.00	28.25
Nickel, refinery, duty paid	56.50	56.50	56.50	50.50	35.00

PIG IRON

F.o.b. furnace prices quoted under GCPR as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$54.00	$54.50	$55.00	$55.50
Brooklyn, N.Y., del.	....	59.18	59.68	....
Newark, del.	56.87	57.37	57.87	58.37
Philadelphia, del.	56.61	57.11	57.61	58.11
Birmingham District				
Alabama City, Ala. R2	48.38	48.88	....	....
Birmingham R2	48.38	48.88	....	....
Birmingham S9	48.38	48.88	....	....
Woodward, Ala. W15	48.38	48.88	....	....
Cincinnati, del.	....	55.49	....	....
Buffalo District				
Buffalo R2	52.00	52.50	53.00	....
Buffalo H1	52.00	52.50	53.00	....
Tonawanda, N.Y. W12	52.00	52.50	53.00	....
No. Tonawanda, N.Y. T9	....	52.50	53.00	....
Boston, del.	62.11	62.61	63.11	....
Rochester, N.Y., del.	54.88	55.38	55.88	....
Syracuse, N.Y., del.	56.91	56.41	56.91	....
Chicago District				
Chicago I-3	52.00	52.50	52.50	53.00
Gary, Ind. U5	52.00	....	52.50	....
Indiana Harbor, Ind. I-2	52.00	....	52.50	....
So. Chicago, Ill. W14	52.00	52.50	52.50	....
So. Chicago, Ill. Y1	52.00	52.50	52.50	....
So. Chicago, Ill. U5	52.00	....	52.50	53.00
Milwaukee, del.	54.06	54.56	54.56	55.06
Muskegon, Mich., del.	....	58.47	58.47	....
Cleveland District				
Cleveland A7	52.00	52.50	52.50	53.00
Cleveland R2	52.00	52.50	52.50	....
Akron, O., del. from Cleve.	54.61	55.11	55.11	55.61
Lorain, O. N3	52.00	....	....	53.00
Duluth, I-3	....	....	52.50	....
Erie, Pa. I-3	52.00	52.50	52.50	53.00
Everett, Mass. E1	....	57.50	58.00	....
Fontana, Calif. K1	58.00	58.50	....	....
Seattle, Tacoma, Wash., del.	....	60.66	....	....
Portland, Oreg., del.	....	60.66	....	....
Los Angeles, San Francisco, del.	60.16	60.66	....	....
Granite City, Ill. G4	53.90	54.40	54.90	....
St. Louis, del. (inc. tax)	54.66	55.16	55.66	....
Ironton, Utah, C11	52.00	52.50	....	....
Geneva, Utah C11	52.00	52.50	....	....
*LoneStar, Tex. L6	48.00	*48.50	48.50	....
Minnequa, Colo. C10	54.00	55.00	55.00	....
Pittsburgh District				
Neville Island, Pa. P6	....	52.50	52.50	53.00
Pitts., N.&S. sides, Ambridge, Aliquippa, del.	....	53.80	53.80	54.30
McKeesRocks, del.	....	53.54	53.54	54.04
Lawrenceville, Homestead, McKeesport, Monaca, del.	....	54.07	54.07	54.57
Verona, del.	....	54.57	54.57	55.07
Brackenridge, del.	....	54.82	54.82	55.32
Bessemer, Pa. U5	52.00	....	52.50	53.00
Clairton, Rankin, So. Duquesne, Pa. U5	52.00	....	....	....
McKeesport, Pa. N3	52.00	....	....	53.00
Monessen, Pa. P7	54.00	....	....	....
Sharpsville, Pa. S6	....	....	52.50	53.00
Steelton, Pa. B2	54.00	54.50	55.00	55.50
Swedeland, Pa. A3	56.00	56.50	57.00	57.50
Toledo, O. I-3	52.00	52.50	52.50	53.00
Cincinnati, del.	57.47	57.97	....	....
Troy, N.Y. R2	54.00	54.50	55.00	55.50
Youngstown District				
Hubbard, O. Y1	52.00*	52.50	52.50	....
Youngstown Y1	52.00	52.50	52.50	....
Youngstown U5	52.00	....	....	53.00
Mansfield, O., del.	56.65	57.15	57.15	57.65

* Low phos. southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson, O. G2, J1	$62.50
Buffalo H1	63.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for each 0.043% max. P.)

Niagara Falls, N.Y. P15	$88.00
Keokuk, Iowa, Openhearth & Fdry., frt. allowed K2	92.50
Keokuk, OH & Fdry., 12½ lb piglets, 16% Si, frt. allowed K2	95.50
Wenatchee, Wash., O.H. & Fdry., frt. allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton

(Low phos semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles, Tenn. T3	$66.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$57.00
Cleveland, R2	60.00
Steelton, Pa. B2	63.37
Philadelphia, delivered	60.00
Troy, N.Y. R2	....

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Semifinished and Finished Steel Products

Mill prices quoted under GCFR as reported to STEEL, Feb. 28, 1952; cents per pound except as otherwise noted. Changes shown in Italics. Code numbers following mill points indicate producing company; key on next two pages

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ... $79.00
Munhall,Pa. U5 ... 52.00

INGOTS, Alloy (NT)
Detroit R7 ... $54.00
Fontana,Calif. K1 ... 80.00
Houston,Tex. S5 ... 62.00
Midland,Pa. C18 ... 54.00
Munhall,Pa. U5 ... 54.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ... $56.00
Clairton,Pa. U5 ... 56.00
Ensley,Ala. T2 ... 56.00
Fairfield,Ala. T2 ... 56.00
Fontana,Calif. K1 ... 75.00
Gary,Ind. U5 ... 56.00
Johnstown,Pa. B2 ... 56.00
Lackawanna,N.Y. B2 ... 56.00
Munhall,Pa. U5 ... 56.00
So.Chicago,Ill. U5 ... 56.00
So.Duquesne,Pa. U5 ... 56.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ... $66.00
Buffalo R2 ... 66.00
Canton,O. R2 ... 66.00
Clairton,Pa. U5 ... 66.00
Cleveland R2 ... 66.00
Conshohocken,Pa. A3 ... 73.00
Detroit R7 ... 66.00
Ensley,Ala. T2 ... 66.00
Fairfield,Ala. T2 ... 66.00
Fontana,Calif. K1 ... 85.00
Gary,Ind. U5 ... 66.00
Geneva,Utah C11 ... 66.00
Houston,Tex. S5 ... 74.00
Johnstown,Pa. B2 ... 66.00
Lackawanna,N.Y. B2 ... 66.00
LosAngeles B3 ... 85.00
Munhall,Pa. U5 ... 66.00
Seattle B3 ... 85.00
So.Chicago R2,U5,W14 ... 66.00
So.Duquesne,Pa. U5 ... 66.00
So.SanFrancisco B3 ... 85.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ... $70.00
Buffalo R2 ... 70.00
Canton,O. R2 ... 70.00
Canton,O.(2%) T7 ... 66.00
Conshohocken,Pa. A3 ... 77.00
Detroit R7 ... 73.00
Fontana,Calif. K1 ... 80.00
Gary,Ind. U5 ... 70.00
Houston,Tex. S5 ... 78.00
Ind.Harbor,Ind. Y1 ... 70.00
Johnstown,Pa. B2 ... 70.00
Lackawanna,N.Y. B2 ... 70.00
LosAngeles B3 ... 90.00
Massillon,O. R2 ... 70.00
Midland,Pa. C18 ... 70.00
Munhall,Pa. U5 ... 70.00
So.Chicago R2,U5,W14 ... 70.00
So.Duquesne,Pa. U5 ... 70.00
Struthers,O. Y1 ... 70.00
Warren,O. C17 ... 70.00

ROUNDS, SEAMLESS TUBE (NT)
Canton,O. R2 ... $82.00
Cleveland R2 ... 82.00
Fontana,Calif. K1 ... 103.00
Gary,Ind. U5 ... 82.00
Massillon,O. R2 ... 82.00
So.Chicago,Ill. R2 ... 82.00
So.Duquesne,Pa. U5 ... 82.00

SHEET BARS (NT)
Fontana,Calif. K1 ... $80.00

SKELP
Aliquippa,Pa. J5 ... $3.45
Munhall,Pa. U5 ... 3.35
Warren,O. R2 ... 3.35
Youngstown R2, U5 ... 3.35

WIRE RODS
Alton,Ill. L1 ... 4.40
AlabamaCity,Ala. R2 ... 4.10
Buffalo W12 ... 4.10
Cleveland A7 ... 4.10
Donora,Pa. A7 ... 4.10
Fairfield,Ala. T2 ... 4.10
Fontana,Calif. K1 ... 4.90
Houston,Tex. S5 ... 4.50
Johnstown,Pa. B2 ... 4.10
Joliet,Ill. A7 ... 4.10
LosAngeles B3 ... 4.90
Minnequa,Colo. C10 ... 4.35
Monessen,Pa. P7 ... 4.30
No.Tonawanda,N.Y. B11 ... 4.10
Pittsburg,Calif. C11 ... 4.75
Portsmouth,O. P12 ... 4.30
Roebling,N.J. R5 ... 4.20
So.Chicago,Ill. R2 ... 4.10
SparrowsPoint,Md. B2 ... 4.20
Sterling,Ill.(1) N15 ... 4.10
Struthers,O. Y1 ... 4.10
Torrance,Calif. C11 ... 4.90
Worcester,Mass. A7 ... 4.40

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ... 4.45
Lackawanna,N.Y. B2 ... 4.45
Munhall,Pa. U5 ... 4.45
So.Chicago,Ill. U5 ... 4.45

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ... 3.60
Aliquippa,Pa. J5 ... 3.65
Bessemer,Ala. T2 ... 3.65
Bethlehem,Pa. B2 ... 3.70
Clairton,Pa. U5 ... 3.65
Fairfield,Ala. T2 ... 3.65
Fontana,Calif. K1 ... 4.25
Gary,Ind. U5 ... 3.65
Geneva,Utah C11 ... 3.65
Houston,Tex. S5 ... 4.05
Ind.Harbor,Ind. I-2 ... 3.65
Johnstown,Pa. B2 ... 3.70
KansasCity,Mo. S5 ... 4.25
Lackawanna,N.Y. B2 ... 3.70
LosAngeles B3 ... 4.25
Minnequa,Colo. C10 ... 4.10
Munhall,Pa. U5 ... 3.65
Niles,Calif.(22) P1 ... 4.85
Phoenixville,Pa. P4 ... 5.90
Portland,Oreg. O4 ... 4.50
Seattle B3 ... 4.30
So.Chicago,Ill. U5, W14 ... 3.65
So.SanFrancisco B3 ... 4.20
Torrance,Calif. C11 ... 4.25
Weirton,W.Va. W6 ... 3.90

Alloy Stand. Shapes
Clairton,Pa. U5 ... 4.35
Fontana,Calif. K1 ... 5.55
Munhall,Pa. U5 ... 4.35
So.Chicago,Ill. U5 ... 4.35

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 ... 5.50
Bessemer,Ala. T2 ... 5.50
Bethlehem,Pa.(14) B2 ... 5.50
Clairton,Pa. U5 ... 5.50
Fairfield,Ala. T2 ... 5.50
Fontana,Calif. K1 ... 6.10
Gary,Ind. U5 ... 5.50
Geneva,Utah C11 ... 5.50
Ind.Harbor,Ind. I-2 ... 5.50
Ind.Harbor,Ind. Y-1 ... 6.00
Johnstown,Pa. B2 ... 5.50
Lackawanna,N.Y.(14) B2 ... 5.50
LosAngeles B3 ... 6.05
Munhall,Pa. U5 ... 5.50
Seattle B3 ... 6.10
So.Chicago,Ill. U5 ... 5.50
So.SanFrancisco B3 ... 6.00
Struthers,O. Y1 ... 6.00

Wide Flange
Bethlehem,Pa. B2 ... 3.70
Clairton,Pa. U5 ... 3.65
Fontana,Calif. K1 ... 4.65
Lackawanna,N.Y. B2 ... 3.70
Munhall,Pa. U5 ... 3.65
So.Chicago,Ill. U5 ... 3.65

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 ... 5.50
Lackawanna,N.Y. B2 ... 5.50
Munhall,Pa. U5 ... 5.45
So.Chicago,Ill. U5 ... 5.45

BEARING PILES
Munhall,Pa. U5 ... 3.65
So.Chicago,Ill. U5 ... 3.65

PLATES, High-Strength Low-Alloy
Aliquippa,Pa. J5 ... 5.65
Bessemer,Ala. T2 ... 5.65
Clairton,Pa. U5 ... 5.65
Cleveland J5, R2 ... 5.65
Conshohocken,Pa. A3 ... 5.90
Fairfield,Ala. T2 ... 5.65
Fontana,Calif.(30) K1 ... 6.25
Gary,Ind. U5 ... 5.65
Geneva,Utah C11 ... 5.65
Ind.Harbor,Ind. I-2 ... 5.65
Ind.Harbor,Ind. Y-1 ... 6.15
Johnstown,Pa. B2 ... 5.65
Munhall,Pa. U5 ... 5.65
Pittsburgh J5 ... 5.65
Seattle B3 ... 6.55
Sharon,Pa. S3 ... 5.70
So.Chicago,Ill. U5 ... 5.65
SparrowsPoint,Md. B2 ... 5.65
Warren,O. R2 ... 5.65
Youngstown Y1 ... 6.15

PLATES, Open-Hearth Alloy
Claymont,Del. C22 ... 4.85
Coatesville,Pa. L7 ... 5.25
Conshohocken,Pa. A3 ... 5.05
Fontana,Calif. K1 ... 5.70
Gary,Ind. U5 ... 4.75
Johnstown,Pa. B2 ... 4.75
Munhall,Pa. U5 ... 4.75
Sharon,Pa. S3 ... 5.20
So.Chicago,Ill. U5 ... 4.75
SparrowsPoint,Md. B2 ... 4.75

FLOOR PLATES
Cleveland J5 ... 4.75
Conshohocken,Pa. A3 ... 4.75
Ind.Harbor,Ind. I-2 ... 4.75
Munhall,Pa. U5 ... 4.75
So.Chicago,Ill. U5 ... 4.75

PLATES, Ingot Iron
Ashland,c.(15) A10 ... 3.95
Ashland,lc(15) A10 ... 4.45
Cleveland,c.l. R2 ... 4.30
Warren,O.c.l. R2 ... 4.30

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ... 3.70
Aliquippa,Pa. J5 ... 3.70
Ashland,Ky. (15) A10 ... 3.70
Bessemer,Ala. T2 ... 3.70
Clairton,Pa. U5 ... 3.70
Claymont,Del. C22 ... 4.15
Cleveland J5, R2 ... 3.70
Coatesville,Pa. L7 ... 4.15
Conshohocken,Pa. A3 ... 4.15
Fairfield,Ala. T2 ... 3.70
Fontana,Calif. (30) K1 ... 4.30
Gary,Ind. U5 ... 3.70
GraniteCity,Ill. G4 ... 4.40
Geneva,Utah C11 ... 3.70
Harrisburg,Pa. C5 ... 6.30
Houston,Tex. S5 ... 4.10
Ind.Harbor,Ind. I-2, Y1 ... 3.70
Johnstown,Pa. B2 ... 3.70
Lackawanna,N.Y. B2 ... 3.70
Minnequa,Colo. C10 ... 4.50
Munhall,Pa. U5 ... 3.70
Pittsburgh J5 ... 3.70
Seattle B3 ... 4.60
Sharon,Pa. S3 ... 3.95
So.Chicago,Ill. U5, W14 ... 3.70
SparrowsPoint,Md. B2 ... 3.70
Steubenville,O. W10 ... 3.70
Warren,O. R2 ... 3.70
Weirton,W.Va. W6 ... 4.00
Youngstown R2, U5, Y1 ... 3.70

PLATES, Carbon A.R.
Fontana,Calif. K1 ... 5.45
Geneva,Utah C11 ... 4.85

PLATES, Wrought Iron
Economy,Pa. B14 ... 8.60

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ... 3.70
Aliquippa,Pa. J5 ... 3.70
Alton,Ill. L1 ... 4.15
Atlanta,Ga. A11 ... 4.25
Bessemer,Ala. T2 ... 3.70
Buffalo R2 ... 3.70
Canton,O. R2 ... 3.70
Clairton,Pa. U5 ... 3.70
Cleveland R2 ... 3.70
Detroit R7 ... 3.85
Emeryville,Calif. J7 ... 4.45
Fairfield,Ala. T2 ... 3.70
Fontana,Calif. K1 ... 4.40
Gary,Ind. U5 ... 3.70
Houston,Tex. S5 ... 4.10
Ind.Harbor,Ind. I-2, Y1 ... 3.70
Johnstown,Pa. B2 ... 3.70
KansasCity,Mo. S5 ... 4.30
Lackawanna,N.Y. B2 ... 3.70
LosAngeles B3 ... 4.40
Milton,Pa. B6 ... 4.55
Minnequa,Colo. C10 ... 4.15
Niles,Calif. P1 ... 5.05
N.Tonawanda,N.Y. B11 ... 3.70
Pittsburg,Calif. C11 ... 4.40
Pittsburgh J5 ... 3.70
Portland,Oreg. O4 ... 4.65
Seattle B3, N14 ... 4.45
Struthers,O. Y1 ... 3.70
Torrance,Calif. C11 ... 4.40
Weirton,W.Va. W6 ... 3.90
So.Chicago R2, U5, W14 ... 3.70
So.Duquesne,Pa. U5 ... 3.70
So.SanFran.,Cal. B3 ... 4.45
Youngstown R2, U5 ... 3.70

BAR SIZE ANGLES, S. Shapes
Aliquippa,Pa. J5 ... 3.70
Atlanta A11 ... 4.25
Bessemer,Ala. B2 ... 3.70
Lackawanna,N.Y. B2 ... 3.70
Niles,Calif. P1 ... 5.05
Portland,Oreg. O4 ... 4.65
SanFrancisco S7 ... 4.85

BAR SIZE ANGLES, H.R. CARBON
Bethlehem,Pa. B2 ... 3.90

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 ... 4.30
Buffalo R2 ... 4.30
Canton,O. R2 ... 4.30
Canton,O.(29) T7 ... 3.95
Clairton,Pa. U5 ... 4.30
Detroit, R7 ... 4.45
Ecorse,Mich. G5 ... 4.65
Fontana,Calif. K1 ... 5.25
Gary,Ind. U5 ... 4.30
Houston,Tex. S5 ... 4.70
Ind.Harbor,Ind. I-2 Y1 ... 4.30
Johnstown,Pa. B2 ... 4.30
KansasCity,Mo. S5 ... 4.90
Lackawanna,N.Y. B2 ... 4.30
LosAngeles B3 ... 5.35
Massillon,O. R2 ... 4.30
Midland,Pa. C18 ... 4.30
So.Chicago R2, U5, W14 ... 4.30
So.Duquesne,Pa. U5 ... 4.30
Struthers,O. Y1 ... 4.30
Warren,O. C17 ... 4.30
Youngstown U5 ... 4.30

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 ... 4.55
Gary,Ind. U5 ... 4.55
Youngstown U5 ... 4.55

BARS & SMALL SHAPES, H.R.
High-Strength Low-Alloy
Aliquippa,Pa. J5 ... 5.55
Bessemer,Ala. T2 ... 5.55
Bethlehem,Pa. B2 ... 5.55
Clairton,Pa. U5 ... 5.55
Cleveland R2 ... 5.55
Fairfield,Ala. T2 ... 5.55
Fontana,Calif. K1 ... 6.60
Gary,Ind. U5 ... 5.55
Ind.Harbor,Ind. I-2 ... 5.55
IndianaHarbor,Ind. Y1 ... 6.05
Johnstown,Pa. B2 ... 5.55
Lackawanna,N.Y. B2 ... 5.55
LosAngeles B3 ... 6.25
Pittsburgh J5 ... 5.55
Seattle B3 ... 6.30
So.Duquesne,Pa. U5 ... 5.55
So.SanFrancisco B3 ... 6.30
Struthers,O. Y1 ... 6.05
Youngstown U5 ... 5.55

BARS, Cold-Finished Carbon
Amoridge,Pa. W18 ... 6.55
BeaverFalls,Pa. M12,R2 ... 6.55
Buffalo B5 ... 6.60
Camden,N.J. P13 ... 5.00
Carnegie,Pa. C12 ... 6.55
Chicago W18 ... 6.55
Cleveland A7, C20 ... 6.55
Detroit P17 ... 6.70
Donora,Pa. A7 ... 6.55
Elyria,O. W8 ... 6.55
FranklinPark,Ill. N5 ... 6.55
Gary,Ind. R2 ... 6.55
GreenBay, Wis. F7 ... 6.55
Hammond,Ind. I-2, M13 ... 6.55
Hartford,Conn. R2 ... 5.10
Harvey,Ill. B5 ... 6.55
LosAngeles R2 ... 6.00
Mansfield,Mass. B5 ... 5.10
Massillon,O. R2, R8 ... 6.55
Monaca,Pa. S17 ... 6.55
Newark,N.J. W18 ... 5.00
Plymouth,Mich. P5 ... 6.50
Pittsburgh J5 ... 6.55
Putnam,Conn. W18 ... 5.10
Readville,Mass. C14 ... 5.10
St.Louis,Mo. M5 ... 6.95
So.Chicago,Ill. W14 ... 6.55
SpringCity,Pa. (5) K3 ... 5.00
Struthers,O. Y1 ... 6.55
Waukegan,Ill. A7 ... 6.55
Youngstown F3, Y1 ... 6.55

BARS, Cold-Finished Alloy
Amoridge,Pa. W18 ... 5.40
BeaverFalls,Pa. M12 ... 5.40
Bethlehem,Pa. B2 ... 5.40
Buffalo B5 ... 5.40
Camden,N.J. P13 ... 5.50
Canton,O. R2 ... 5.40
Canton,O.(29) T7 ... 4.90
Carnegie,Pa. C12 ... 5.40
Chicago W18 ... 5.40
Cleveland A7 ... 5.45
Cleveland C20 ... 5.55
Detroit P17 ... 5.55
Donora,Pa. A7 ... 5.45
Elyria,O. W8 ... 5.40
Gary,Ind. R2 ... 5.40
Hammond,Ind. I-2, M13 ... 5.40
Hartford,Conn. R2 ... 5.85
Harvey,Ill. B5 ... 5.40
Lackawanna,N.Y. B2 ... 5.40
Mansfield,Mass. B5 ... 5.85
Massillon,O. R2, R8 ... 5.40
Midland,Pa. C18 ... 5.40
Monaca,Pa. S17 ... 5.40
Newark,N.J. W18 ... 5.75
Plymouth,Mich. P5 ... 5.60
So.Chicago,Ill. R2, W14 ... 5.40
Struthers,O. Y1 ... 5.40
Warren,O. C17 ... 5.40
Waukegan,Ill. A7 ... 5.45
Worcester,Mass. A7 ... 5.75
Youngstown F3, Y1 ... 5.40

RAIL STEEL BARS
ChicagoHts.(3,4) C2 ... 4.75
ChicagoHts.(3,4) I-2 ... 4.75
Franklin,Pa. (3,4) F5 ... 4.75
FortWorth,Tex.(26) T4 ... 4.85
Huntingtn,W.Va.(3) W7 ... 5.50
Marion,O.(3) P11 ... 4.75
Moline,Ill.(3) R2 ... 3.80
Tonawanda(3,4) B12 ... 4.75
Williamsport(3) S19 ... 5.00
Williamsport(4) S19 ... 5.10

BARS, Wrought Iron
Dover,N.J.(staybolt)U1 ... 15.00
Dover,(Eng.Bolt)U1 ... 13.55
Dover,(Wrgh.Iron)U1 ... 12.25
Economy,Pa.(S.R.) B14 ... 9.60
Economy,Pa.(D.R.)B14 ... 11.90
Economy,(Staybolt)B14 ... 12.20
McK.Rks.(Staybolt)L5 ... 14.50
McK.Rks.(S.R.) L5 ... 9.60
McK.Rks.(D.R.) L5 ... 13.00

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ... 3.70
Atlanta A11 ... 4.25
Buffalo R2 ... 3.70
Cleveland R2 ... 3.70
Emeryville,Calif. J7 ... 4.45
Fairfield,Ala. T2 ... 3.70
Fontana,Calif. K1 ... 4.40
Gary,Ind. U5 ... 3.70
Houston,Tex. S5 ... 4.10
Ind.Harbor,Ind. I-2, Y1 ... 3.70
Johnstown,Pa. B2 ... 3.70
KansasCity,Mo. S5 ... 4.30
Lackawanna,N.Y. B2 ... 3.70
LosAngeles B3 ... 4.40
Milton,Pa. B6 ... 4.55
Minnequa,Colo. C10 ... 4.15
Niles,Calif. P1 ... 5.05
Pittsburg,Calif. C11 ... 4.40
Pittsburgh J5 ... 3.70
Portland,Oreg. O4 ... 4.65
Seattle B3, N14 ... 4.45
So.Chicago,Ill. U5 ... 3.70
So.SanFrancisco B3 ... 4.45
Torrance,Calif. C11 ... 4.40
Youngstown U5, Y1 ... 3.70

SHEETS, H.R. (19 gage)
AlabamaCity,Ala. R2 ... 4.75
Dover,O. R1 ... 5.05
Ind.Harbor,Ind. I-2 ... 5.40
Mansfield,O. E6 ... 5.65
Niles,O. N12 ... 5.75
Torrance,Calif. C11 ... 5.40

SHEETS, H.R. (14 ga., heavier)
High-Strength Low-Alloy
Cleveland J5, R2 ... 5.40
Conshohocken,Pa. A3 ... 5.65
Ecorse,Mich. G5 ... 5.95
Fairfield,Ala. T2 ... 5.40
Fontana,Calif. K1 ... 6.35
Gary,Ind. U5 ... 5.40
Ind.Harbor,Ind. I-2 ... 5.40
Ind.Harbor,Ind. Y1 ... 5.90
Irvin,Pa. U5 ... 5.40
Lackawanna(35) B2 ... 5.40
Pittsburgh J5 ... 5.40
Sharon,Pa. S3 ... 5.40
So.Chicago,Ill. U5 ... 5.40
SparrowsPoint(36) B2 ... 5.40
Warren,O. R2 ... 5.40
Weirton,W.Va. W6 ... 5.75
Youngstown U5 ... 5.40
Youngstown Y1 ... 5.90

SHEETS, Cold-Rolled
High-Strength Low-Alloy
Cleveland J5, R2 ... 6.65
Ecorse,Mich. G5 ... 7.10
Fontana,Calif. K1 ... 7.50
Gary,Ind. U5 ... 6.55
IndianaHarbor,Ind. Y1 ... 7.05
IndianaHarbor,Ind. I-2 ... 6.55
Irvin,Pa. U5 ... 6.55
Lackawanna(37) B2 ... 6.55
Pittsburgh J5 ... 6.55
SparrowsPoint(38) B2 ... 6.55
Warren,O. R2 ... 6.55
Weirton,W.Va. W6 ... 6.90
Youngstown Y1 ... 7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.35
Cleveland, O. R2	4.35
Ecorse,Mich. G5	4.50
Fairfield,Ala. T2	4.35
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	5.30
Gary,Ind. U5	4.35
Granite City,Ill. G4	5.05
Ind Harbor,Ind. I-2, Y1	4.35
Irvin,Pa. U5	4.35
Lackawanna,N.Y. B2	4.35
Middletown,O. A10	4.35
Pittsburg,Calif. C11	5.30
Pittsburgh, J5	4.35
Sparrows Point,Md. B2	4.35
Steubenville,O. W10	4.35
Warren,O. R2	4.35
Weirton,W.Va. W6	4.35
Youngstown, Y1	4.35

SHEETS, Galv'd No. 10 Steel

Alabama City,Ala. R2	4.80
Ashland,Ky.(8) A10	4.80
Canton,O. R2	4.80
Dover,O. R1	5.50
Fairfield,Ala. T2	4.80
Gary,Ind. U5	4.80
Granite City,Ill. G4	5.50
Ind Harbor,Ind. I-2	4.80
Irvin,Pa. U5	4.80
Kokomo,Ind.(13) C16	5.20
Martins Ferry,O. W10	4.80
Niles,O. N12	6.00
Pittsburg,Calif. C11	5.55
Sparrows Point,Md. B2	4.80
Steubenville,O. W10	4.80
Torrance,Calif. C11	5.55
Weirton,W.Va. W6	4.80

SHEETS, Galvanized No. 10, High Strength Low-Alloy

Irvin,Pa. U5	7.20
Sparrows Point(29) B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	5.35
Irvin,Pa. U5	5.35
Kokomo,Ind.(13) C16	5.75
Niles,O. N12	6.55

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	5.05
Middletown,O. A10	5.05

SHEETS, Electro Galvanized

Cleveland,R2 (28)	5.65
Niles,O. R2 (28)	5.65
Weirton,W.Va. W6	5.50

SHEETS, Zinc Alloy

Ind Harbor,Ind. I-2	5.70

SHEETS, Drum Body

Pittsburg,Calif. C11	4.30
Torrance,Calif. C11	4.30

SHEETS, Wall Casing

Fontana,Calif. K1	5.10

BLUED Stock, 29 ga.

Yorkville,O. W10	6.80
Follansbee,W.Va.(23) F4	6.85

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.15	$7.40	$7.80
Fairfield,Ala. T2	7.25	7.50	7.90
Gary,Ind. U5	7.15	7.40	7.80
Granite City,Ill. G4	7.35	7.60	8.00
Ind Harbor,Ind. I-2, Y1	7.15	7.40	7.80
Irvin,Pa. U5	7.15	7.40	7.80
Niles,O. R2	7.15	7.40	7.80
Pittsburg,Calif. C11	7.90	8.15	8.55
Sparrows Point,Md. B2	7.25	7.50	7.90
Weirton,W.Va. W6	7.15	7.40	7.80
Yorkville,O. W10	7.15	7.40	7.80

SHEETS, SILICON, H.R. or C.R. (22 Ga.) COILS (Cut Lengths 1/2c lower)

	Field	Armature	Electric	Motor	Dynamo
Beech Bottom,W.Va. (cut lengths)			7.25	8.50	9.30
Brackenridge,Pa. A4			7.75	9.00	9.80
Granite City,Ill. G4 (cut lengths)			7.95	9.20	
Ind Harbor,Ind. I-2	6.95	7.25	(34)		
Mansfield,O. E6 (cut lengths)	7.10	7.25	7.75	9.00	9.80
Niles,O. N12 (cut lengths)		6.75	7.25		
Vandergrift,Pa. U5		7.25	7.75	9.00	9.80
Warren,O. R2	6.95	7.25	7.75	9.00	9.80
Zanesville,O. A10		7.25	7.75	9.00	9.80

SHEETS, SILICON (22 Ga. Base) Coils (Cut Lengths 1/2c lower)

Transformer Grade	72	65	58	52
Beech Bottom,W.Va. (cut lengths)	9.85	10.40	11.10	11.90
Brackenridge,Pa. A4	10.35			
Vandergrift,Pa. U5	10.35	10.90	11.60	12.40
Warren,O. R2	10.35			
Zanesville,O. A10	10.35	10.90	11.60	12.40

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)			14.75	15.25
Vandergrift,Pa. U5	12.90	13.75	14.75	15.25

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.65
Cleveland,R2	4.65
Gary,Ind. U5	4.65
Granite City,Ill. G4	5.35
Ind Harbor,Ind. I-2	4.65
Irvin,Pa. U5	4.65
Middletown,O. A10	4.65
Youngstown, Y1	4.65

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.25
Fairfield,Ala. T2	6.35
Gary,Ind. U5	6.25
Granite City,Ill. G4	6.45
Ind Harbor,Ind. I-2, Y1	6.25
Irvin,Pa. U5	6.25
Niles,O. R2	6.25
Pittsburg,Calif. C11	7.00
Sparrows Point,Md. B2	6.35
Warren,O. R2	6.25
Weirton,W.Va. W6	6.25
Yorkville,O. W10	6.25

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	5.85
Gary,Ind. U5	5.85
Granite City,Ill. G4	6.05
Ind Harbor,Ind. Y1	5.30
Irvin,Pa. U5	5.85
Yorkville,O. W10	6.15

SHEETS, Culvert No. 16

	Cu Alloy	Cu Fe
Ashland,Ky. A10	5.60	
Canton,O. R2	5.60	6.15
Fairfield,Ala. T2	5.60	5.85
Gary,Ind. U5	5.60	5.85
Indiana Harbor,Ind. I-2	5.60	5.85
Irvin,Pa. U5	5.60	5.85
Kokomo,Ind. C16	6.25	
Martins Ferry,O. W10	5.60	5.85
Pittsburg,Calif. C11	6.35	
Sparrows Pt. B2	5.60	
Torrance,Calif. C11	6.35	

SHEETS, Culvert, No. 16 Pure Iron

Ashland,Ky. A10	5.85
Fairfield,Ala. T2	5.85

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	3.85
Cleveland,R2	4.20
Ind Harbor,Ind. I-2	3.85
Warren,O. R2	4.20

SHEETS, Cold-Rolled Ingot Iron

Cleveland,R2	4.95
Middletown,O. A10	4.85
Warren,O. R2	4.95

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	5.05
Canton,O. R2	5.55

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.30
Middletown,O. A10	5.30

SHEETS, ALUMINIZED

Butler,Pa. A10	8.15

TINPLATE American Coke (Base Box)

	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.45	$8.70
Fairfield,Ala. T2	8.55	8.80
Gary,Ind. U5	8.45	8.70
Ind Har., I-2, Y1	8.45	8.70
Irvin,Pa. U5	8.45	8.70
Pitts. Cal. C11	9.20	9.45
Sp.Pts. Md. B2	8.55	8.80
Warren,O. R2	8.45	8.70
Weirton,W.Va. W6	8.45	8.70
Yorkville,O. W10	8.45	8.70

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.60
Gary,Ind. U5	7.50
Irvin,Pa. U5	7.50
Sparrows Point,Md. B2	7.60
Yorkville,O. W10	7.50

SHEETS, LT. Coated Ternes, 6 lb

Yorkville,O. W10	$8.40

SHEET, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5	$9.50
Yorkville,O. W10	9.50

SHEETS, Long Terne Steel (Commercial Quality)

Beech Bottom,W.Va. W10	5.20
Gary,Ind. U5	5.20
Mansfield,O. E6	6.05
Middletown,O. A10	5.20
Niles,O. N12	6.00
Weirton,W.Va. W6	5.20

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.60

ROOFING, SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.50

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	5.30
Conshohocken,Pa. A3	5.55
Ecorse,Mich. G5	5.95
Fairfield,Ala. T2	5.30
Fontana,Calif. K1	6.20
Gary,Ind. U5	5.30
Ind Harb.,Ind. I-2	5.30
Indiana Harbor,Ind. Y1	5.80
Lackawanna,N.Y. B2	4.95
Los Angeles(25) B3	6.05
Seattle B3	6.30
Sharon,Pa. S3	5.40
So.San Francisco(25) B3	6.05
Sparrows Point,Md. B2	4.95
Warren,O. R2	5.30
Weirton,W.Va. W6	5.75
Youngstown Y1	5.80
Youngstown U5	5.30

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland,J5	6.70
Cleveland,A7	6.55
Dover,O. G6	7.30
Fontana,Calif. K1	6.95
Lackawanna,N.Y. B2	6.40
Sharon,Pa. S3	6.55
Sparrows Point,Md. B2	6.40
Warren,O. R2	6.55
Weirton,W.Va. W6	7.20
Youngstown Y1	7.05

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.50
Alton,Ill. L4	3.95
Ashland,Ky.(8) A10	3.50
Atlanta, A11	4.05
Bessemer,Ala. T2	3.50
Bridgeport,Conn.(10) S15	4.05
Buffalo(27) R2	3.50
Butler,Pa. A10	3.50
Carnegie,Pa. S18	4.00
Conshohocken,Pa. A3	3.90
Detroit, M1	4.40
Ecorse,Mich. G5	3.50
Fairfield,Ala. T2	3.50
Fontana,Calif. K1	4.75
Gary,Ind. U5	3.50
Houston,Tex. S5	3.90
Ind Harbor,Ind. I-2, Y1	3.50
Johnstown,Pa.(25) B2	3.50
Kansas City,Mo.(9) S8	4.10
Lackawanna,N.Y.(32) B2	3.50
Los Angeles B3	4.25
Milton,Pa. B6	4.35
Minnequa,Colo. C10	4.55
New Britain,(10) S15	4.00
So.Tonawanda,N.Y. B11	3.50
Pittsburg,Calif. C11	4.25
Riverdale,Ill. A1	3.50
San Francisco S7	4.85
Seattle B3, N14	4.50
Sharon,Pa. S3	4.00
So.Chicago,Ill. W14	3.50
So.San Francisco B3	4.25
Sparrows Point,Md. B2	3.50
Torrance,Calif. C11	4.25
Warren,O. R2	3.50
Weirton,W.Va. W6	3.90
West Leechburg,Pa. A4	3.75
Youngstown U5, Y1	3.50

STRIP, Hot-Rolled Alloy

Bridgeport,Conn.(10) S15	5.45
Carnegie,Pa. S18	5.85
Fontana,Calif. K1	6.70
Gary,Ind. U5	5.50
Houston,Tex. S5	5.90
Kansas City,Mo. S8	6.10

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7		6.80	7.40	9.35	11.65
Bridgeport,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
Bristol,Conn. W1			7.70	9.65	
Carnegie,Pa. S18		6.80	7.40	9.35	11.65
Cleveland,J5	4.65	6.45	7.40	9.35	11.65
Detroit,Mich. D3	5.60	7.05	7.65		
Detroit D2	5.60	6.65	7.25		
Dover,O. G6	5.50	6.80	7.40	9.35	11.65
Franklin Park,Ill. T6	5.00	6.60	7.55	9.50	11.80
Harrison,N.J. C18			7.70	9.65	11.95
Mattapan,Mass. T6	5.50	6.75	7.70	9.65	11.95
New Brit'n,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
New Castle,Pa. B4	5.55	6.80	7.40	9.35	
New Castle,Pa. B5	5.50	6.80	7.40	9.35	11.65
New Haven,Conn. D2	5.85	6.75	7.35		
New York W3			7.10	7.70	9.65 11.95
Pawtucket,R.I. N8					
Cleveland Worcester,Mass. Base	5.85	6.80	7.40	9.35	11.65
Worcester,Mass. T6	5.35	7.10	7.70	9.65	11.95
Sharon,Pa. S3	5.35	6.80	7.40	9.35	11.65
Trenton,N.J. R5			7.10	7.70	9.65 11.95
Wallingford,Conn. W2	5.85	6.75	7.35	9.30	11.60
Weirton,W.Va. W6	5.35	6.80	7.40	9.35	11.65
Worcester,Mass. A7	4.95	6.75	7.70	9.65	11.95
Worcester,Mass. T6	5.50	6.75	7.70	9.65	11.95
Youngstown C8		6.80	7.40	9.35	11.65

Spring Steel (Tempered)

Trenton,N.J. R5		10.30	12.50	15.35
Trenton,N.J. C18		10.30	12.50	15.35
New York W3		10.30	12.50	15.35

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.50
Berea,O. C7	6.60
Bridgeport,Conn.(10) S15	5.35
Butler,Pa. A10	4.65
Cleveland A7, J5	4.65
Dearborn,Mich. D3	5.90
Detroit D2	5.60
Detroit M1	5.45
Dover,O.(40) G6	5.50
Ecorse,Mich. G5	4.85
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	6.30
Franklin Park,Ill.(40) T6	4.90
Ind Harbor,Ind. I-2	4.90
Lackawanna,N.Y. B2	4.65
Los Angeles C1	6.40
Mattapan,Mass. T6	5.50
Middletown,O. A10	4.65
New Britain(10) S15	5.35
New Castle,Pa. B4	5.35
New Castle,Pa.(40) E5	5.25
New Haven,Conn. D2	5.85
New Haven,Conn. A7	5.15
Pawtucket,R.I. R3	6.00
Pawtucket,R.I.(21) NS	5.85
Riverdale,Ill.(40) A1	4.80
Rome,N.Y. R6	5.10
Sharon,Pa. S3	5.35
Sparrows Point,Md. B2	4.65
Trenton,N.J. R5	6.00
Wallingford,Conn. W2	5.85
Warren,O.(40) T5	4.25
Warren,O. R2	4.65
Weirton,W.Va. W6	4.65
Youngstown C8 (40)	5.25
Youngstown Y1	4.65

STRIP, Electro Galvanized

Dover,O. G6	5.50
Warren,O. T5	5.25
Weirton,W.Va. W6	5.15
Youngstown C8	5.25

Key to Producers

A1 Acme Steel Co.
A2 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Bonardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B12 Buffalo Steel Co.
B14 A. M. Byers Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Corp.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliot Bros. Steel Co.
E6 Empire Steel Corp.

F2 Fifth Sterling Steel
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire

G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp
G6 Greer Steel Co.

H1 Hanna Furnace Corp.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div. Borg-Warner Corp.

J1 Jackson Iron & Steel Co.
J2 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Electric Steel
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10)81S	10.75
Carnegie,Pa. S1S	10.60
Cleveland A7	10.00
Dover,O. G6	10.50
Fontana,Calif. K1	11.65
Harrison,N.J. C1S	10.60
Midland,Pa. C1S	10.60
NewBrtn,Conn.(10)81S	10.75
Pawtucket,R.I.(11) NS	10.75
Pawtucket,R.I.(12) NS	11.05
Sharon,Pa. S3	10.60
Worcester,Mass. A7	10.30
Youngstown C8	10.60

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.75
Warren,O. R2	4.10

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	5.25

TIGHT COOPERAGE HOOP

Atlanta A11	4.65
Riverdale,Ill. A1	3.90
Sharon,Pa. S3	4.15
Youngstown U5	3.75

WIRE, Tire Bead

Bartonville,Ill.(1) K4	10.90
Monessen,Pa. P16	11.40
Roebling, N.J. R5	11.55

WIRE, Merchant Quality

	(6 to 8 gage)	An'ld	Galv.
Alabama City,Ala. R2	5.70	5.95	
Aliquippa,Pa. J5	5.70	6.15	
Atlanta A11	5.95	6.40	
Bartonville(19)K4	5.70	6.15	
Buffalo W12	4.85		
Cleveland A7	5.70	6.15	
Crawfordsville,Ind. MS	5.95	6.40	
Donora,Pa. A7	5.70	6.15	
Duluth,Minn. A7	5.70	6.15	
Fairfield T2	5.70	6.15	
Houston,Tex. S5	6.10	6.55	
Johnstown,Pa. B2	5.70	6.15	
Joliet,Ill. A7	5.70	6.15	
KansasCity,Mo. S5	6.30	6.75	
Kokomo C16	5.80	6.05	
LosAngeles B3	6.65		
Minnequa C10	5.95	4.45	
Monessen P7	5.95	6.40	
Palmer W12	5.15		
Pitts.,Calif. C11	6.65	6.80	
Prtsmth.(18)P12	6.10	6.60	
Rankin A7	5.70	6.15	
So.Chicago R2	5.70	5.95	
So.S.Fran. C10	6.65	7.10	
SparrowsPt. B2	5.80	6.25	
Sterling,Ill.(1)N15	5.70	6.15	
Struthers,O. Y1	5.70	6.15	
Torrance,Cal. C11	6.65		
Worcester A7	6.00	6.45	

ROPE WIRE

	(A)	(B)
Alton,Ill. L1	8.65	8.90
Bartonville,Ill. K4	8.55	8.80
Buffalo W12	8.55	8.80
Fostoria,O. S1	8.85	9.10
Johnstown,Pa. B2	8.55	8.80
Monessen,Pa. P16	8.55	8.80
Monessen,Pa. P7	8.80	9.05
Palmer,Mass W12	8.65	9.10
Portsmouth,O. P12	8.55	8.80
Roebling,N.J. R5	8.55	9.10
SparrowsPt. B2	8.65	8.90
Struthers,O. Y1	8.55	8.80
Worcester J4, T6	8.85	9.10

(A) Plow and Mold Plow
(B) Improved Plow.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	4.85
Aliquippa,Pa. J5	4.85
Atlanta A11	5.10
Alton,Ill. L1	5.05
Bartonville,Ill.(1) K4	4.85
Buffalo W12	4.85
Chicago W13	5.10
Cleveland A7, C20	4.85
Crawfordsville,Ind. MS	5.10
Donora,Pa. A7	4.85
Duluth,Minn. A7	4.85
Fairfield,Ala. T2	4.85
Fostoria,O.(24) S1	5.35
Houston S5	5.25
Johnstown,Pa. B2	4.85
Joliet,Ill. A7	4.85
KansasCity,Mo. S5	5.45
Kokomo,Ind. C16	4.95
LosAngeles B3	5.80
Minnequa,Colo. C10	5.10
Monessen,Pa. P7	5.10
Newark, 6-8 ga. I-1	5.50
No.Tonawanda B11	4.85
Palmer,Mass. W12	5.15
Pittsburg,Calif. C11	5.80
Portsmouth,O. P12	5.25
Rankin,Pa. A7	4.85
So.Chicago,Ill. R2	4.85
So.SanFrancisco C10	5.80
SparrowsPoint,Md. B2	4.95
Sterling,Ill.(1) N15	4.85
Struthers,O. Y1	4.85
Torrance,Calif. C11	5.80
Waukegan,Ill. A7	4.85
Worcester,Mass. A7, T6	5.15

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	6.20
Buffalo W12	6.35
Cleveland A7	5.85
Crawfordsville,Ind. MS	6.20
Detroit D2	6.20
Dover,O. G6	6.20
Fostoria,O. S1	6.00
Kokomo,Ind. C16	5.70
FranklinPark,Ill. T6	6.20
Massillon,O. R8	5.85
Monessen,Pa. P16	5.85
Monessen,Pa. P7	6.10
NewHaven,Conn. D2	6.50
Pawtucket,R.I.(12) NS	6.85
Trenton,N.J. R5	6.15
Worcester,Mass. A7	6.15
Worcester,Mass. T6	6.50
Worcester,Mass. W12	6.65

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	8.50
Monessen,Pa. P16	8.50
Roebling,N.J. R5	8.80
SparrowsPoint,Md. B2	8.60
Johnstown,Pa. B2	8.50

WIRE (16 gage)

	Stone	An'd Galv. Stone
Aliquippa J5	10.15	12.15
Bartonville(1)K4	10.25	11.95
Cleveland A7	10.25	12.15
Crawfordsville,MS	10.30	12.00
Fostoria,O. S1	10.40	13.00
Johnstown B2	10.25	12.15
Kokomo C16	10.25	11.95
Minnequa C10	10.40	12.40
Palmer,Mass.W12	10.25	12.15
Pitts.Cal. C11	10.60	12.50
Prtsmth.(18) P12	10.55	12.30
SparrowsPt. B2	10.35	12.25
Waukegan A7	10.25	12.15

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	6.25
Alton,Ill. L1	6.45
Bartonville,Ill.(1) K4	6.25
Buffalo W12	6.25
Cleveland A7	6.25
Donora,Pa. A7	6.25
Duluth,Minn. A7	6.25
Fostoria,O. S1	6.25
Johnstown,Pa. B2	6.25
LosAngeles B3	7.20
Milbury,Mass.(12) N6	6.05
Monessen,Pa. P7, P16	6.25
Palmer,Mass. W12	6.55
Pittsburg,Calif. C11	7.20
Roebling,N.J. R5	6.55
Portsmouth,O. P12	6.25
So.Chicago,Ill. R2	6.25
So.SanFrancisco C10	7.20
SparrowsPoint,Md. B2	6.35
Struthers,O. Y1	6.25
Trenton,N.J. A7	6.55
Waukegan,Ill. A7	6.25
Worcester A7, T6, W12	6.55
Worcester,Mass. J4	6.75

WIRE, Fine & Weaving (8" Coils)

Bartonville,Ill.(1) K4	8.90
Buffalo W12	8.90
Chicago W13	8.90
Cleveland A7	8.90
Crawfordsville,Ind. MS	8.95
Fostoria,O. S1	8.90
Johnstown,Pa. B2	8.90
Kokomo,Ind. C16	8.90
Monessen,Pa. P16	8.90
Palmer,Mass. W12	9.20
Portsmouth,O. P12	8.90
Roebling,N.J. R5	9.20
Waukegan,Ill. A7	8.90
Worcester,Mass. A7, T6	9.20

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	137
Aliquippa,Pa. J5	141
Atlanta A11	144
Bartonville,Ill.(19) K4	144
Crawfordsville,Ind. MS	146
Donora,Pa. A7	141
Duluth,Minn. A7	141
Fairfield,Ala. T2	141
Houston,Tex. S5	149
Johnstown,Pa. B2	141
Joliet,Ill. A7	141
KansasCity,Mo. S5	153
Kokomo,Ind. C16	147
Minnequa,Colo. C10	147
Monessen,Pa. P7	146
Pittsburg,Calif. C11	161
Portsmouth,O.(18) P12	148
Rankin,Pa. A7	141
So.Chicago,Ill. R2	137
So.SanFran.,Calif. C10	161
SparrowsPoint,Md. B2	143
Sterling,Ill.(1) N15	141

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	123
Atlanta A11	126
Bartonville,Ill.(19) K4	123
Crawfordsville,Ind. MS	132
Donora,Pa. A7	123
Duluth,Minn. A7	123
Fairfield,Ala. T2	123
Joliet,Ill. A7	123
KansasCity,Mo. S5	135
Kokomo,Ind. C16	125
Minnequa,Colo. C10	128
Pittsburg,Calif. C11	147
So.Chicago,Ill. R2	123
So.SanFran.,Calif. C10	147
SparrowsPoint,Md. B2	125
Sterling,Ill.(1) N15	123

WIRE, Upholstery Spring

Aliquippa,Pa. J5	5.90
Alton,Ill. L1	6.10
Buffalo W12	5.90
Cleveland A7	5.90
Donora,Pa. A7	5.90
Duluth,Minn. A7	5.90
Johnstown,Pa. B2	5.90
LosAngeles B3	6.85
Monessen,Pa. P7, P16	5.90
NewHaven,Conn. A7	6.20
Palmer,Mass. W12	6.20
Pittsburg,Calif. C11	6.85
Portsmouth,O. P12	5.90
Roebling,N.J. R5	6.20
So.Chicago,Ill. R2	5.90
So.SanFrancisco C10	6.85
SparrowsPoint,Md. B2	6.00
Torrance,Calif. C11	6.85
Trenton,N.J. A7	6.20
Waukegan,Ill. A7	5.90
Worcester,Mass. A7	6.20

WOVEN FENCE, 9-15½ga.

	Col.
AlabamaCity,Ala. R2	127
Ala.City,Ala. 12-18ga.R2	214
Aliquippa,Pa.9-14½ga.J5	131
Atlanta A11	134
Bartonville,Ill.(19) K4	131
Crawfordsville,Ind. MS	133
Donora,Pa. A7	131
Duluth,Minn. A7	131
Fairfield,Ala. T2	131
Houston,Tex. S5	139
Johnstown,Pa. B2	131
Johnstown,17ga. 6" B2	205
Johnstown,17ga. 4" B2	208
Joliet,Ill. A7	131
KansasCity,Mo. S5	143
Kokomo,Ind. C16	133
Minnequa,Colo. C10	139
Monessen,Pa. P7	136
Pittsburg,Calif. C11	154
Portsmouth,O.(18) P12	138
Rankin,Pa. A7	131
So.Chicago,Ill. R2	127
Sterling,Ill.(1) N15	131

FENCE POSTS

Chicago,Hts.,Ill. C2	140
Duluth,Minn. A7	125
Franklin,Pa. F5	140
Huntington,W.Va. W7	140
Johnstown,Pa. B2	140
Marion,O. P11	140
Minnequa,Colo. C10	130
Moline,Ill. R2	136
So.Chicago,Ill. R2	140
Tonawanda,N.Y. B12	140
Williamsport,Pa. S19	150

TRACK BOLTS (20) Treated

KansasCity,Mo. S5	9.85
Lebanon,Pa.(3); B2	9.85
Minnequa,Colo. C10	9.85
Portsmouth,O. P14	9.85
Seattle B3	10.35

RAILS

	Std. No. 1	Std. No. 2	All No. 2	Std. Toe Rails 60 lb Under
Bessemer,Pa. U5	3.60	3.50	3.55	4.00
Ensley,Ala. T2	3.60	3.50		4.00
Fairfield,Ala. T2				4.00
Gary,Ind. U5	3.60	3.50	3.55	
Huntington,W.Va. W7				5.00
Ind.Harbor,Ind. I-2	3.60	3.50	3.55	
Johnstown,Pa. B2				(16)4.00
Lackawanna,N.Y. B2	3.60	3.50		4.00
Minnequa,Colo. C10	3.60	3.50		4.50
Steelton,Pa. B2	3.60	3.50		
Williamsport,Pa. S19				4.75

NAILS & STAPLES, Stock To dealers & mfrs. (7)

	Col.
AlabamaCity,Ala. R2	118
Aliquippa,Pa.(13) J5	118
Atlanta A11	121
Bartonville,Ill.(19) K4	118
Chicago,Ill. W13	118
Cleveland A9	125
Crawfordsville,Ind. MS	122
Donora,Pa. A7	118
Duluth,Minn. A7	118
Fairfield,Ala. T2	118
Galveston,Tex. D7	126
Houston,Tex. S5	126
Johnstown,Pa. B2	118
Joliet,Ill. A7	118
Kansas City,Mo. S5	130
Kokomo,Ind. C16	120
Minnequa,Colo. C10	123
Monessen,Pa. P7	124
Pittsburg,Calif. C11	137
Portsmouth,O. P12	124
Rankin,Pa. A7	118
So.Chicago,Ill. R2	118
SparrowsPoint,Md. B2	120
Sterling,Ill.(1) N15	118
Torrance,Calif. C11	138
Worcester,Mass. A7	124

NAILS, Cut (100 lb keg) To dealers (33)

Conshohocken,Pa. A3	$7.35
Wheeling,W.Va. 10	7.35

TIE PLATES

Fairfield,Ala. T2	4.50
Gary,Ind. U5	4.50
Ind.Harbor,Ind. I-2	4.50
Lackawanna,N.Y. B2	4.50
Minnequa,Colo. C10	4.50
Pittsburg,Calif. C11	4.65
Seattle B3	4.65
Steelton,Pa. B2	4.50
Torrance,Calif. C11	4.65

JOINT BARS

Bessemer,Pa. U5	4.70
Fairfield,Ala. T2	4.70
Ind.Harbor,Ind. I-2	4.70
Joliet,Ill. U5	4.70
Lackawanna,N.Y. B2	4.70
Minnequa,Colo. C10	4.70
Steelton,Pa. B2	4.70

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1	6.15
KansasCity,Mo. S5	6.40
Lebanon,Pa. B2	6.15
Minnequa,Colo. C10	6.15
Pittsburgh J5	6.15
Seattle B3	6.65
So.Chicago,Ill. R2	6.15
Struthers,O. Y1	6.15
Youngstown R2	6.15

AXLES

Ind.Harbor,Ind. S13	5.60
Johnstown,Pa. B2	5.60

TOOL STEEL

Grade	$ per lb
Regular Carbon	0.230
Extra Carbon	0.270
Special Carbon	0.325
Oil Hardening	0.350
5% Cr Hot Work	0.350
Hi-Carbon-Cr	0.635

Grade by Analysis

W	Cr	V	Co	Mo	
18	4	1			1.505
18	4	2			1.650
20	25	4	25	1 6 12 25 3	5.35-3.675
19	4	2	7		2.460
18	25	4	25	1 4 7.5	2.125
18	4	2	9		2.445-2.45
13	5	4	3		1.6025
W	Cr	V	Mo		
6	4	5	1	9 5	0.96-0.965
6	4	3	6		1.190
1.5	4	1	8.5		0.810

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

Footnotes:
(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, 5 cwt. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.50c for 17 Ga. & heavier.
(14) Also wide flange beams.
(15) ½" and thinner.
(16) ½ lb and under.
(17) Plate only.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) ½ c.w.t. for untreated.
(21) New Haven, Conn. base.
(22) Del. San Francisco Bay area.
(23) 28 Ga. 36" wide.
(24) Deduct 0.20c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing, mill lengths, to fabricators; to consumers, 5.60c.
(27) Bar mill sizes.
(28) Plus extra.
(29) Subject to 10% increase.
(30) Sheared; add 0.55c for universal mill.
(31) Not annealed.
(32) Rd. or square edge.
(33) To jobbers, deduct 20c.
(34) 7.25c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter; 60" & narrower.
(38) 14 gage & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.

Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.

N2 National Supply Co.
N3 National Tube Div.
N5 Neisen Steel & Wire Co.
N6 NewKing-HighCarb Wire
Ns Newman-Crosby Steel
N12 Niles Rolling Mill Div.
N14 Nrthwst. Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.

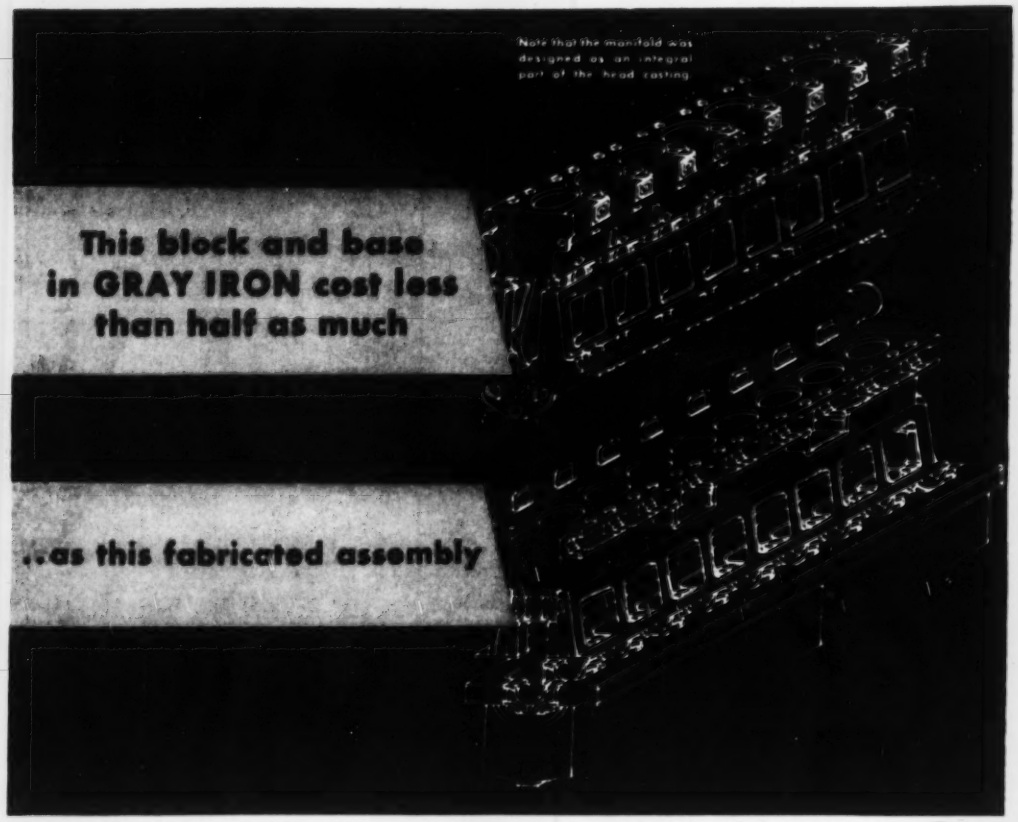
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield S & I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.

U1 Ulster Iron Works
U4 Universal Cyclops Steel
U5 United States Steel Co.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
Y1 YoungstownSheet&Tube


Note that the manifold was designed as an integral part of the head casting
This block and base in GRAY IRON cost less than half as much
..as this fabricated assembly

You can't afford to pass up savings like this!

GRAY IRON CASTINGS COST LESS than fabricated assemblies in over 90 per cent of the cases studied by the manufacturer of this well-known diesel engine (name on request). Shop records of this manufacturer indicate that average savings of 50% can be obtained by using castings.

BETTER STILL—GRAY IRON GIVES YOU MORE ADVANTAGES than any other single production material or method of production: Castability, Rigidity, Low Notch Sensitivity, Wear, Heat and Corrosion Resistance . . . Durability . . . Vibration Damping . . . Machinability, Wide Strength Range.

CONSIDER GRAY IRON FIRST for maximum flexibility of design at minimum cost. Progressive design engineers do — that's why the gray iron foundry industry is the second largest in the metal-working field.

Make it Better with Gray Iron

Second largest industry in the metal-working field

SCRAP IS NEEDED FOR DEFENSE—KEEP IT MOVING!

GRAY IRON FOUNDERS' SOCIETY, INC.

NATIONAL CITY-E. 6th BLDG., CLEVELAND 14, OHIO

STANDARD PIPE, T. & C

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Black A	Black B	Black C	Galvanized D	Galvanized E	Galvanized F
⅛	5.5c	0.24	34.0	32.0		+0.5	+2.5	
¼	6.0	0.42	28.5	26.5		+3.5	−5.5	
⅜	6.0	0.57	23.5	21.5		+10.0	12.0	
½	8.5	0.85	36.0	34.0	35.0	12.0	10.0	11.0
¾	11.5	1.18	39.0	37.0	38.0	16.0	14.0	15.0
1	17.0	1.68	41.5	39.5	40.5	19.5	17.5	18.5
1¼	23.0	2.28	42.0	40.0	41.0	20.5	18.5	19.5
1½	27.5	2.78	42.5	40.5	41.5	21.5	19.5	20.5
2	37	3.68	43.0	41.0	42.0	22.0	20.0	21.0
2½	58.5	5.82	43.5	41.5	42.5	23.0	21.0	22.0
3	76.5	7.62	43.5	41.5	42.5	23.0	21.0	22.0

Column A: Etna, Pa. N2 and 38½% on 3½", 4"; Butler, Pa. ¼-⅜", F6; Benwood, W. Va. 3½ points lower on ¼-⅜", 1½ points lower on ½", and 2 points lower on ¾-2". W10; Sharon, Pa. M8. 1 point higher on ¼", 2 points lower on ½" and ¾". Wheatland, Pa. W9. 2 points lower on ¼-⅜", ½". Following make ½" and larger; Lorain, O., N3; Youngstown R2 and 38¼% on 3½" and 4"; Youngstown Y1; Aliquippa, Pa. J5; Fontana, Calif. K1 quotes 11½ points lower on ½" and larger continuous weld and 24% on 3½" and 4".

Columns B & E: Sparrows Point, Md. B2.

Columns C & F: Indiana Harbor, Ind., Y1; Alton, Ill., Gary base; 2 points lower discount L1.

Column D: Butler, Pa. F6. ¼-⅜": Benwood, W. Va. W10, except plus 4% on ¼", plus 6% on ¾", plus 13% on ⅜" and 15.5% on 3½" 4"; Sharon, Pa. M6, plus 2.5 on ½". 1 point lower on ¾", 1½ points lower on 1" and 1¼", 2 points lower on 1½", 2", 2½" and 3". Wheatland, Pa. W9, add 2 points on ¼", ¾", ⅜". 1 point lower on ½", 2 points lower on 1", 1½", 2", 1½ points lower on 1¼", 2½", 3". Etna, Pa. N2 and 15.5% on 3½", 4". Following quote only on ½" and larger; Lorain, O. N3; Youngstown R2, and 15½% on 3½" and 4"; Youngstown Y1, Aliquippa, Pa. J5 quotes 1 point lower on ½", 2 points lower on 1", 1½", 2", 1½ points lower on 1¼", 2½" and 3".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	3.68	29.5	8.0	29.5	8.0
2½	58.5	5.82	32.5	11.5	32.5	11.5
3	76.5	7.62	32.5	11.5	32.5	11.5
3½	92.0	9.20	34.5	13.5	34.5	13.5
4	$1.09	10.89	34.5	13.5	34.5	13.5
5	1.48	14.81	37.0	16.0	37.0	16.0
6	1.92	19.18	37.0	16.0	37.0	16.0

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5 quotes 1½ pts lower on 2", 1 pt lower on 2½-6 in.; Lorain N3; Youngstown Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	13.45	16.47	15.36	15.36
1¼	13	16.09	19.71	15.61	18.19
1½	13	17.27	21.15	17.25	20.39
1¾	13	19.29	23.62	19.62	23.06
2	13	21.62	26.48	21.99	25.86
2¼	13	24.35	29.82	24.50	28.84
2½	12	26.92	32.97	26.98	31.76
2¾	12	29.65	36.32	29.57	34.76
2½	12	32.11	39.33	31.33	36.84
3	12	34.09	41.64	32.89	38.70

CLAD STEELS

(Cents per pound)

Cladding	Plates— Carbon Base 10%	Plates— Carbon Base 20%	Strip— Cold-Rolled Carbon Base 10%	Strip— Cold-Rolled Carbon Base Sides	Sheets— Carbon Base 10%	Sheets— Carbon Base 20%	Sheets— Carbon Base Both	Cu Base Both Sides
Stainless					19.75	26.24–27.50	27.00	
304	25.00	29.50			24.50	27.50–27.77	27.00	
309	30.50	35.00						
310	36.50	41.00						144.00
316	29.50	34.00			26.00	35.92–36.50		
317	34.50	39.00						
318	33.50	38.00						
321	26.50	31.00			23.00	33.00	111.00	
347	27.50	32.00			24.00	33.50–33.83	130.00	
405	21.25	27.75						
410	20.75	27.25						
Nickel	33.55	45.15	41.00	54.00				
Inconel	41.23	54.18						165.00
Monel	34.93	46.28						
Copper*			23.70†	29.65‡				

* Deoxidized. † 20.20c for hot-rolled. ‡ 26.40c for hot-rolled. Production points for carbon base products: Stainless plates, sheet, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; nickel, copper-clad strip, Carnegie, Pa., S18. Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants, per cent off list for less than case lots to consumers)

6 in. and shorter:	
½-in. & smaller diam.	15
⅝-in. & ¾-in.	18.5
⅞-in. and larger	17.5
Longer than 6 in.	
All diams.	14
Lag bolts, all diams.	
6 in. and shorter	23
over 6 in. long	21
Ribbed Necked Carriage	18.5
Blank	34
Plow	34
Step, Elevator, Tap and Sleigh Shoe	21
Tire bolts	12
Boiler & Fitting-Up Bolts	31

NUTS

H.P. & C.P. Square:	Reg. Hvy.
½-in. & smaller	15 15
⅝-in. & ¾-in.	12 6.5
⅞-in.-1⅛-in.	8 1
1⅛-in. & larger	7.5 1
H.P. Hex.:	
½-in. & smaller	26 22
⅝-in. & ¾-in.	16.5 6.5
⅞-in.-1⅛-in.	12 2
1⅛-in. & larger	8.5 2
C.P. Hex.:	
½-in. & smaller	26 22
⅝-in. & ¾-in.	23 17.5
⅞-in. & 1⅛-in.	19.5 12
1⅛-in. & larger	12 6.5

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)

	Reg.	Hvy.
½-in. & smaller	35	28.5
⅝-in. & ¾-in.	29½	22
⅞-in.-1⅛-in.	24	15
1⅛-in. & larger	13	8.5
		Light
½-in. & smaller		35
⅝-in. to ¾-in.		28.5
⅞-in. to 1⅛-in.		26

STEEL STOVE BOLTS

(F.o.b. plant; per cent off list in packages)

Plain finish	48 & 10
Plated finishes	31 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:	
⅜-in. & smaller	42
⅞-in. through 1 in.	34
Longer than 6 in.:	
⅜-in. & smaller	26
⅞-in. through 1 in.	4

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter	38
1 in. and smaller diam. x over 6 in.	26

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	35
¼-in. diam. & larger	16
N.F. thread, all diams.	19

RIVETS

F.o.b. midwestern plants

Structural ½-in., larger 7.85c

⅞-in. under ..... 36 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ... List to list-plus-$1

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 70%, $43.50; $40.

Imported, net ton, duty paid, metallurgical grade, $33-$35.

ELECTRODES

(Threaded, with nipples, unboxed f.o.b. plant)

GRAPHITE

Diam. In.	Length —Inches—	Cents per lb
17 to 20	60, 72	17.85
8 to 16	48, 60, 72	17.85
7	48, 60	19.57
6	48, 60	20.95

CARBON

35 to 40	110	8.03
30	65, 84, 110	8.03
24	72 to 104	8.03
17 to 20	34, 90	8.03

STAINLESS STEEL

Type	Sheets	C.R. Strip	Bars Wire Structurals
301	41.00	34.00	31.25
302	41.25	38.75	31.50
303	43.25	40.25	34.00
304	43.25	38.75	33.00
309	56.00	53.00	44.75
316	57.00	59.00	49.25
321	49.25	48.25	37.00
347	53.75	52.25	41.50
410	36.50	30.50	25.75
416	37.00	37.00	26.25
420	44.00	47.00	31.25
430	39.00	31.00	26.25
501	27.50	26.00	14.25
502	28.50	27.00	15.25

Bait. Types 301-347 sheet, except 303 and 309, E2.

Brackenridge, Pa., Sheets A4 quotes slight variations on Types 301-347.

Bridgeville, Pa., bars, wire, sheets & strip U4.

Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502, A10.

Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502 S18.

Cleveland, strip A7.

Detroit, strip M1 quotes 34.00c on Type 301, 36.50c; 302, 38.50c; 304, 58.50c; 316, 52.00c; 347, 39.50c; 410, 31.00c; 430.

Dunkirk, N. Y., bars, wire A4 quotes slight variations on Types 301-347.

Duquesne, Pa., bars U5.

Fort Wayne, Ind., bars and wire, except Types 501 & 502 J6 quotes slight variations on Types 301-347.

Gary, Ind., sheets except Type 416 U5.

Harrison, N. J., strip and wire C18.

Massillon, O., all items, R2.

McKeesport, Pa., strip, Type 410; bars & wire, Types 410 through 430 and 31.25c on Type 302, 33.75c on 303, 32.75c on 304, 48.75c on 316, 36.75c on 321, 41.25c on 347 F2.

McKeesport, Pa., bars, sheets except Type 416 U5.

Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & strip C18.

Munhall, Pa., bars U5.

Pittsburgh, sheets C18.

Reading, Pa., strip except 34.25c on Type 301 and 50.00c on 309; bars, except 31.50c on Type 301 and 45.25c on 309 C4.

Sharon, Pa., strip, except Types 303, 309, 416, 501, 502 and 34.25c on Type 301 S3.

So. Chicago, Ill., bars & structurals U5.

Syracuse, N. Y., bars, wire & Structurals C18.

Titusville, Pa., bars, U4.

Wallingford, Conn., strip W2 quotes 0.25c higher.

Washington, Pa., bars, sheets & strip, except 0.25c higher on Type 301 J3.

Washington, Pa., Types 301 through 347 sheets & strip except 303, 309; 316 sheets 62.00c, strip 64.00c W4.

Watervliet, N. Y., structurals & bars A4 quotes variations on Types 301-347.

Waukegan bars & wire A7.

West Leechburg, Pa., strip, A4 quotes slight variations on Types 301-347.

Youngstown, strip except Types 303, 309, 316, 416, 501 and 502 and 34.25c on Type 301 C8.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure, benzol ... 30.00-35.00

Toluol, one deg. ... 26.00-33.00

Industrial xylol ... 25.00-33.50

Per ton bulk, ovens

Sulphate of ammonia $32-$45

Cents per pound, ovens

Phenol, 40 carlots, non-returnable drums ... 17.25

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

Sponge iron	Cents
98+% Fe, carlots, 17.00	
Swedish, c.i.f. New York, in bags, 8.85–9.95	
Electrolytic iron:	
Annealed, 99.5% Fe	42.50
Unannealed, 99+% Fe	36.50
Unannealed, 99+% Fe (minus 325 mesh)	53.50
Powder Flakes	48.50
Carbonyl Iron:	
97.9-99.8% size 5 to 10 microns, $3.00-148.00	
Aluminum:	
Carlots, freight allowed	29.50
Atomized, 500 lb drums, freight allowed	32.50
Antimony	75.85
Brass, 20-ton lots, 30.00-33.25	
Bronze, 10-ton lots	51.25-60.00
Phosphor-Copper, 20-ton lots	50.00
Copper:	
Electrolytic	37.25
Reduced	33.75
Lead	26.50
Magnesium	75.00-85.50
Manganese:	
Minus 100-mesh	57.00
Minus 35 mesh	52.00
Minus 200 mesh	62.00
Nickel, unannealed	86.00
Nickel-Silver 5-ton lots	45.00
Silicon	38.50
Solder (plus cost of metal)	8.50
Stainless Steel, 302	83.00
Zinc, 10-ton lots, 25.00-32.50	
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over	6.00
Less than 1000 lb	6.15
98.8% minus 65 mesh:	
1000 lb and over	4.15
Less than 1000 lb	4.25
Molybdenum:	
99.9% minus 200 mesh	3.24
Chromium, electrolytic 99% Cr min.	3.50

METALLURGICAL COKE

Price per net ton

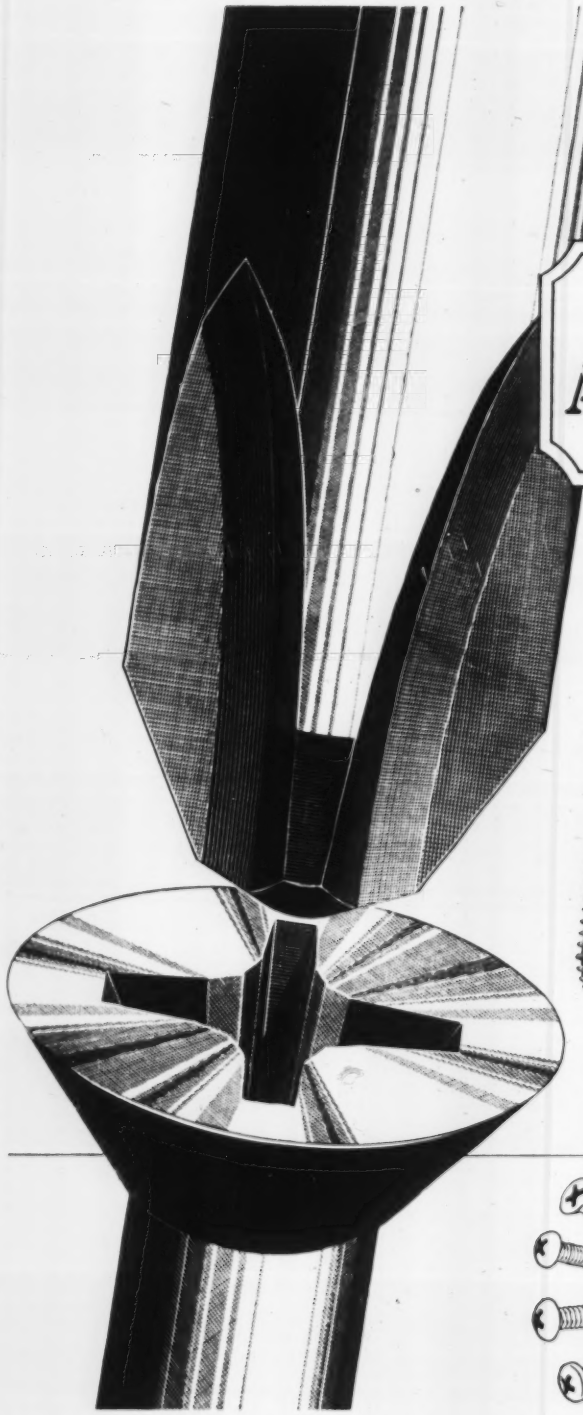
BEEHIVE OVENS

Connellsvill fur.	$14.50-15.00
Connellsvill fdy.	17.00-18.00
New River foundry	21.30
Wise county, foundry	15.95
Wise county, furnace	15.20

OVEN FOUNDRY COKE

Kearney, N. J. ovens	$22.75
Everett, Mass., Ovens:	
New England, del.	*24.80
Chicago ovens	23.00
Chicago, del.	24.50
Terre Haute, ovens	22.50
Milwaukee, ovens	23.75
Indianapolis, ovens	22.75
Chicago, del.	26.42
Cincinnati, del.	25.95
Detroit, del.	28.85
Ironton, O., ovens	22.50
Cincinnati, del.	25.12
Painesville, O., ovens	24.00
Cleveland, del.	25.82
Erie, Pa., ovens	23.50
Birmingham, ovens	20.30
Birmingham, del.	21.60
Philadelphia, ovens	22.70
Neville Island, Pa., ovens	23.00
Swedeland, Pa., ovens	22.60
St. Louis, ovens:	
St. Louis del.	25.40
Portsmouth, O., ovens	22.50
Cincinnati, del.	25.12
Detroit, ovens	24.00
Detroit, del.	25.00
Buffalo, del.	26.50
Flint, del.	26.59
Pontiac, del.	25.47
Saginaw, del.	26.92

* Or within $4.15 freight zone from works.



THESE ARE AMERICAN

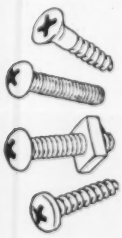
PHILLIPS Recessed Head Wood Screws

For assembly of parts made of wood or for attachment of metalware to wood. When the features of the Phillips Recess — savings of time, work, spoilage, dollars—are added to American Quality — sharp gimlet points and sharp threads, well formed heads — you build into your product an up-to-date symbol of quality, a fastener from the "American Line" which has stood for leadership since 1838.

PHILLIPS "TWINfast"* Wood Screws

Parallel twin spiral threads give *added* speed in driving. And the relieved shank of the screw prevents splitting, assures tight seating and good holding power—factors which afford manufacturers of furniture, boats, and other wood products additional savings in assembly costs. American "TWINfast"* Phillips Screws embody the two most important improvements in wood screw design since the introduction of the gimlet pointed screw by The American Screw Company back in 1850.

*Reg. U. S. Pat. Office.



AMERICAN SCREW COMPANY

PHILLIPS HEADquarters

WILLIMANTIC, CONNECTICUT

Main Office & Plant
Willimantic, Conn.
Office & Plant, Norristown, Pa.
Office & Warehouse, Chicago, Ill.

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, for delivery within switching limits, subject to extras.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140‡		Carbon	Floor
New York (city)	6.30	7.11	8.45	6.95	...	6.39	7.19	9.28	6.27	6.64	7.88
JerseyCty(c'try)	6.07	6.91	8.25	6.75	...	6.29	7.23	8.98	6.04	6.41	7.68
Boston (city)	6.40	7.18	8.55	6.35	...	6.25	7.04	9.00	6.40	6.55	7.84
Boston (c'try)	6.20	6.98	8.35	6.15	...	6.05	6.84	9.20	6.29	6.35	7.64
Phila. (city)	6.04	6.97	8.35	6.33	7.11	6.27	7.16	8.97	6.09	6.30	7.29
Phila. (c'try)	5.79	6.72	8.10	6.08	6.86	6.02	6.91	8.72	5.84	6.05	7.04
Balt. (city)	5.74	7.00	8.40	6.23	...	6.21	6.83	...	6.33	6.33	7.57
Balt. (c'try)	5.54	6.80	8.20	6.03	...	6.01	6.63	...	6.13	6.13	7.37
Norfolk, Va.	6.78	...	...	...	...	6.04	7.30	...	6.30	6.30	7.15
Richmond, Va.	5.74	6.57	8.38	6.14	...	5.91	6.59	...	6.72	6.86	8.00
Wash. (w'hse)	6.05	7.26	8.49	6.50	...	6.50	7.26	...	6.60	6.65	7.86
Buffalo (del.)	5.74	6.52	8.29	6.06	...	5.72	6.65	10.65††	6.00	6.23	7.55
Buffalo (w'hse)	5.54	6.32	8.09	5.86	...	5.52	6.45	10.45††	5.80	6.03	7.35
Pitts. (w'hse)	5.50	6.32	7.85	5.59	6.90	5.45	6.20	10.30††	5.65	5.65	6.89
Detroit (w'hse)	5.75	6.47	8.12	5.76	7.15	5.76	6.64	9.13	6.09	5.88	7.21
Cleveland (del.)	5.74	6.52	8.16	5.85	7.18	5.76	6.60	8.91	6.15	6.02	7.40
Cleve. (w'hse)	5.54	6.32	7.96	5.65	6.98	5.56	6.40	8.71	5.95	5.82	7.20
Cincin. (w'hse)	5.84	6.38	8.29	5.77	...	5.75	6.64	...	6.09	6.14	7.28
Chicago (city)	5.74	6.52	8.05	5.69	...	5.67	6.50	10.30††	5.85	5.90	7.09
Chicago (w'hse)	5.54	6.32	7.85	5.49	...	5.47	6.30	10.10††	5.65	5.70	6.89
Milwau. (city)	5.90	...	8.21	5.85	...	5.83	6.88	10.46††	6.01	6.06	7.25
Milwau. (c'try)	5.70	...	8.01	5.65	...	5.63	6.68	10.26††	5.81	5.86	7.05
St. Louis (del.)	6.02	6.80	8.33	6.56	...	5.95	6.88	10.58	6.22	6.27	7.46
St. L. (w'hse)	5.82	6.60	8.13	6.36	...	5.75	6.68	10.38	6.02	6.07	7.26
Kans. City(city)	6.40	7.20	8.40	6.35	...	6.35	7.20	...	6.50	6.60	7.80
Kans.Cty(w'hse)	6.20	7.00	8.20	6.15	...	6.15	7.00	...	6.30	6.40	7.60
Birm'hm (city)	5.75	6.55	6.90§	5.70	...	5.70	7.53	...	5.85	6.10	8.25
Birm'hm(w'hse)	5.60	6.40	6.75§	5.55	...	5.55	7.53	...	5.70	5.95	8.23
Los Ang. (city)	6.50	8.30§	9.45	6.60	10.65	6.45	8.35	...	6.50	6.50	8.75
L. A. (w'hse)	6.30	8.10§	9.25	6.40	10.45	6.25	8.15	...	6.30	6.30	8.55
Seattle-Tacoma	7.02	8.84	9.60	7.54	...	6.70	9.19	10.35	6.54	6.90	8.73
San Francisco	6.62	7.88§	9.10§	6.43	...	6.45	8.20	11.15	6.32	6.37	8.50

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; § as rolled; ** 16 gauge; †† as annealed; §§ 15 gage. Base quantities, 2000 to 9999 lb except as noted. Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; #—500 to 1499 lb; ‡—450 to 1499 lb; ¶—3500 lb and over; ‖—1000 to 1999 lb.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural), lower lake ports.

After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in applicable lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

Old range bessemer	$8.70
Old range nonbessemer	8.55
Mesabi bessemer	8.45
Mesabi nonbessemer	8.30
High phosphorus	8.30

Eastern Local Ore

Cents per unit del., E. Pa.

Foundry and basic 56-62% concentrates contract	17.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	nom.
Long-term contract	$20.00-24.00
North African hematites (spot)	26.00-28.00
Brazilian iron ore, 68-69% (spot)	30.00-31.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$65.00
Domestic scheelite mines	65.00

Manganese Ore

Manganese, 48% nearby, $1.18-$1.22 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 85c-87c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African	
48% 2.8:1	$39.00-42.00
48% 3:1	44.00-45.00
48% no ratio	30.00-32.00
South African Transvaal	
44% no ratio	$27.00-28.00
48% no ratio	34.00-35.00
Brazilian	
44% 2.5:1 lump	nom.
Rhodesian	
45% no ratio	$29.00
48% no ratio	31.50-32.00
48% 3:1 lump	50.00-51.00
Domestic—rail nearest seller	
48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb. molybdenum content, mines	$1.00

REFRACTORIES

(Ceiling prices, effective Feb. 12, 1952, per 1000 units)

Fire Clay Brick

High-Heat Duty: Pueblo, Colo., $85; Ashland, Grahn, Hayward, Hitchins, Haideman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lochhaven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $94.60; Salina, O., $99.60; Niles, O., $104; Los Angeles, Pittsburg, Calif, $126.

Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $94.60; Hays, Pa., $100.10; Niles, O., $102; E. Chicago, Ind., Joliet, Rockdale, Ill., $104.50; Cutler, Utah, $111; Los Angeles, $117.

Insulating Fire Brick

2300° *F:* Massillon, O., $170; Clearfield, Pa., $171; Augusta, Ga.; Beaver Falls, Zelienople, Pa., Mexico, Mo., $178.

Ladle Brick

Dry Pressed: Bessemer, Ala., $61.60; Aisey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wellsville, O., $66, Mexico, Mo., $70; Clearfield, Pa., Portsmouth, O., $79.20; Perla, Ark., $88; Los Angeles, $105; Pittsburg, Calif., $106.

Sleeves

Reesdale, Pa., $121; Johnstown, Pa., $121.30; Clearfield, Pa., $128.70; St. Louis, $131.45; Athens, Tex., $134.20.

Nozzles

Reesdale, Pa., $193.60; Johnstown, Pa., $198.55; Clearfield, Pa., $209; St. Louis, $213.95; Athens, Tex., $214.50.

Runners

Reesdale, Pa., $150.70; Johnstown, Pa., $154; Clearfield, Pa., $160; St. Louis, $162.25; Athens, Tex., $166.10.

High-Alumina Brick

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $158.40; Danville, Ill., $161.40.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $200.20; Danville, Ill., $203.20.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $233.20; Danville, Ill., $236.20; Clearfield, Pa., $240.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%): Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%): Contract, carload, lump, bulk 10.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Del. Spot add 0.25c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max.): Contract, c.l. lump, bulk 7.0c per lb of alloy, c.l. packed 7.75c; ton lot 8.5c, less ton 9.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 42-52%, Fe 8-12%, C 0.50% max.): Contract, carload, lump, packed 20.25c per lb of alloy, ton of 21c, less ton 22.25c. Freight allowed. Spot add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 14.50c per lb of briquet, carload packed 15.2c, ton 16.0c, less ton 16.9c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 10.95c per lb of briquet c.l. packaged 11.75c, ton lot 12.55c, less ton 13.45c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 11.15c, per lb of briquet, c.l. packed 11.95c, ton lot 12.75c, less ton 13.65c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size — weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.95c per lb of briquet, c.l. packed 7.75c, ton lot 8.85c, less ton 9.45c. Delivered. Spot, add 0.25c.

(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 7.1c, c.l. packed 7.9c, ton lot 8.7c, less ton 9.6c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

NOTE—For current quotations on manganese, titanium and "other" ferroalloys, see page 177 Feb. 18 issue; for chromium, silicon, vanadium, boron, tungsten alloys, page 141 Feb. 25 issue.

CEILING PRICES, IRON AND STEEL SCRAP

Prices as set forth in Office of Price Stabilization ceiling price regulation No. 5, as amended Feb. 5, 1952.

STEELMAKING SCRAP COMPOSITE

Feb. 28	$43.00
Feb. 21	43.00
Jan. 1952	43.00
Feb. 1951	44.00
Feb. 1947	33.50

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin, and from which ceiling on line and ceiling delivered prices are computed on scrap of railroad origin.

Grade 1 Basing Point	No. 1 Bundles Dealer, Indus trial	No. 1 Heavy Melt Rail road
Alabama City, Ala	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00
Harrisburg, Pa.	42.50	44.50
Houston, Tex.	37.00	39.00
Johnstown, Pa.	44.00	46.00
Kansas City, Mo.	39.50	41.50
Kokomo, Ind.	42.00	44.00
Los Angeles	35.00	37.00
Middletown, O.	43.00	45.00
Midland, Pa.	44.00	46.00
Minnequa, Colo.	38.00	40.00
Monessen, Pa.	44.00	46.00
Phoenixville, Pa.	42.50	44.50
Pittsburg, Calif.	35.00	37.00
Pittsburgh, Pa.	44.00	46.00
Portland, Oreg.	35.00	37.00
Portsmouth, O.	42.00	44.00
St. Louis, Mo.	41.00	43.00
San Francisco	35.00	37.00
Seattle, Wash.	35.00	37.00
Sharon, Pa.	44.00	46.00
Sparrows Pt., Md.	42.00	44.00
Steubenville, O.	44.00	46.00
Warren, O.	44.00	46.00
Weirton, W. Va.	44.00	46.00
Youngstown, O.	44.00	46.00

Differentials from Base

Differentials per gross ton for other grades of dealer and industrial scrap:

O-H and Blast Furnace Grades	
2 No. 1 Bushelling	Base
3 No. 1 Heavy Melting	— $1.00
4 No. 2 Heavy Melting	— 1.00
5 No. 2 Bundles	— 1.00
6 Machine Shop Turnings	—10.00
7 Mixed Borings and Short Turnings	— 6.00
8 Shoveling Turnings	— 6.00
9 No. 2 Bushelling	— 4.00
10 Cast Iron Borings	— 6.00
Elec. Furnace and Fdry. Grades	
11 Billet, Bloom & Forge Crops	+ 7.50
12 Bar Crops & Plate	+ 5.00
13 Cast Steel	+ 5.00
14 Punchings & Plate Scrap	+ 2.50
15 Electric Furnace Bundles	+ 2.00
Cut Structurals & Plate	
16 3 feet and under	+ 3.00
17 2 feet and under	+ 5.00
18 1 foot and under	+ 6.00
19 Briquetted Cast Iron Borings	Base
Foundry Steel:	
20 2 feet and under	Base
21 1 foot and under	+ 2.00
22 Springs and Crankshafts	+ 1.00
23 Alloy Free Turnings	— 3.00
24 Heavy Turnings	— 1.00
25 Briquetted Turnings	Base
26 No. 1 Chemical Borings	— 3.00
27 No. 2 Chemical Borings	— 6.00
28 Wrought Iron	+10.00
29 Shafting	+ 10.00
31 Old Tin & Terne Plated Bundles	—10.00

Unprepared Grades

When compressed, constitutes:

32 No. 1 Bundles	— 6.00
33 No. 2 Bundles	— 9.00
34 Other than material suitable for hydraulic compression	— 8.00

Restriction on Use

(1) Prices for Grades 11 and 23 may be charged only when shipped to a consumer directly from an industrial producer; otherwise ceiling prices shall not exceed prices established for Grades 12 and 8, respectively.

(2) Prices established for Grades 26 and 27 may be charged only when sold for use for chemical or annealing purposes, and in the case of Grade 27, for briquetting and direct charge into an electric furnace; otherwise ceiling prices shall not exceed prices established for Grade 10.

(3) Prices established for Grade 28 may be charged only when sold to a producer of wrought iron; otherwise ceiling price shall not exceed ceiling price for corresponding grade of basic open-hearth.

(4) Premiums for Grades 11-18, 20 and 21 may be charged only when sold for use in electric and acid open-hearth furnaces of foundries, or in basic O-H or blast furnace under NPA allocation or OPS authorization.

(5) Prices for Grade 29 may be charged only when sold for forging or retolling purpose.

Special Pricing Provisions

(1) Sellers of Grades 26 and 27 may make an extra charge of $1.50 per ton for loading in box cars, of 75 cents per ton for covering gondola cars with a weather-resistant covering.

(2) Ceiling price of pit scrap, ladle scrap, salamander scrap, skulls, skimmings or scrap recovered from slag dumps and prepared to charging box size, shall be computed by deducting from the price of No. 1 heavy melting steel of dealer and industrial origin, the following amounts: Where iron content is 5% and over, $6; 7½% and over, $10; less than 7½%, $12.

(3) Ceiling price of any inferior grade of scrap not listed shall not exceed the price of No. 1 bundles less $15.00.

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 railroad heavy melting steel) for other grades of railroad steel scrap:

2 No. 2 Heavy Melting Steel	—$2.00
3 No. 2 Steel Wheel	Base
4 Hollow Bored Axles and loco. axles with keyways between the wheelseats	Base
5 No. 1 Bushelling	— 3.50
6 No. 1 Turnings	— 3.00
7 No. 2 Turnings, Drillings & Borings	—12.00
8 No. 2 Cast Steel and uncut wheelcenters	+ 6.00
9 Uncut Frogs, Switches	Base
10 Flues, Tubes & Pipes	+ 8.00
11 Structural, Wrought Iron and/or steel, uncut	+ 6.00
12 Destroyed Steel Cars	+ 8.00
13 No. 1 Sheet Scrap	+ 9.50
14 Scrap Rails, Random Lengths	+ 2.00
15 Rerolling Rails	+ 7.00
Cut Rails:	
16 3 feet and under	+ 5.00
17 2 feet and under	+ 6.00
18 18 inches and under	+ 8.00
19 Cast Steel, No. 1	+ 3.00
20 Uncut Tires	+ 2.00
21 Cut Tires	+ 5.00
Boilers & Side Frames	
Uncut	Base
Cut	+ 3.00
24 Angles, Splice Bars & Tie Plates	+ 5.00
25 Solid Steel Axles	+ 12.00
26 Steel Wheels, No. 3 oversize	Base
27 Steel Wheels, No. 3	+ 5.00
28 Spring Steel	+ 5.00
29 Couplers & Knuckles	+ 5.00
30 Wrought Iron	+ 8.00
31 Firebrakes	— 8.00
32 Boilers	— 6.00
33 No. 2 Sheet Scrap	—13.00
34 Carsides, Ironts, Car Ends, cut apart	— 6.00
35 Unassorted Iron & Steel	— 6.00
36 Unprepared scrap, not suitable for hydraulic compression	— 8.00

Restrictions on Use

(1) Price established for Grade 15 may be charged only when purchased and sold for rerolling uses, otherwise, ceiling shall not exceed that for Grade 14.

(2) Price established for Grade 30 may be charged only when sold to a producer of wrought iron; otherwise, ceiling shall not exceed that for No. 1 heavy melting steel.

(3) Price for Grade 25 may be charged only when sold for retolling and forging purposes; otherwise ceiling shall not exceed that for base grade (No. 1).

CAST IRON SCRAP

Ceiling price per gross ton for following grades shall be f.o.b. shipping point:

Cast Iron	
1 No. 1 (Cupola)	$49.00
2 No. 2 (Charging Box)	47.00
3 No. 3 (Hvy. Breakable)	43.00
4 No. 4 (Burnt Cast)	41.00
5 Cast Iron Brake Shoes	41.00
6 Stove Plate	46.00
7 Clean Auto Cast	52.00
8 Unstripped Motor Blocks	43.00
9 Wheels, No. 1	47.00
10 Malleable	55.00
11 Drop Broken Machinery	52.00

Restrictions on Use

(1) Ceiling shipping point price which a basic open-hearth consumer may pay for No. 1 cast iron, clean auto cast, malleable or drop broken machinery cast shall be ceiling price for No. 2 charging box cast.

(2) Ceiling shipping point price which any foundry other than a malleable producer may pay for grade 10 shall be ceiling price for No. 1 cast iron.

Preparation Charges

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of dealer or industrial origin authorized by OPS are:

(1) For preparing into Grades No. 3, No. 4 or No. 2, $8.

(2) For hydraulically compressing Grade No. 1, $6 per ton; Grade No. 5, $8.

(3) For crushing Grade No. 6, $3. For preparing into:

(4) Grade No. 25, $6.

(5) Grade No. 19, $6.

(6) Grades No. 12, No. 13, No. 14, No. 16, or No. 20, $10.

(7) Grade No. 17 or No. 21, $11.

(8) Grade No. 18, $12.

(9) For hydraulically compressing Grade No. 15, $8.

(10) For preparing into Grade No. 28, $10.

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of railroad origin shall be:

(1) For preparing into Grade No. 1 and Grade No. 2, $8.

(2) For hydraulically compressing Grade No. 13, $6.

For preparing into:

(3) Grade No. 16, $4.

(4) Grade No. 17, $5.

(5) Grade No. 18, $7.

(6) Grade No. 21, $4.

(7) Grade No. 23, $4.

Ceiling fees per gross ton which may be charged for intransit preparation of cast iron are limited to:

(1) For preparing Grade No. 8 into grade No. 7, $9.

(2) For preparing Grade No. 3 into Grade No. 11, $7.

(3) For preparing Grade No. 3 into Grade No. 1, $4.

Whenever scrap has arrived at its point of delivery and consumer engages a dealer to prepare such scrap, no fee may be charged for such services unless consumer obtains prior written OPS approval.

Commissions

No commission shall be payable to a broker in excess of $1.

Premium for Alloy Content

No premium may be charged for alloy content except: $1.25 per ton for each 0.25% of nickel where scrap contains not less than 1% and not over 5.25% nickel; $2 per ton for scrap containing not less than 0.15 per cent molybdenum and $3 for scrap containing not less than 0.65% molybdenum; for scrap containing not less than 10% manganese, $4 for scrap in sizes larger than 12 in. x 24 in. x 8 in. and $11 for scrap cut in that size or smaller (applicable only if scrap is sold for electric furnace uses or on NPA allocation); $1 for scrap conforming to SAE 52100.

Switching Charges

Switching charges to be deducted from basing point prices of dealer, industrial and nonoperating railroad scrap, to determine ceiling shipping point prices for scrap originating in basing points are per gross ton:

Alabama City, Ala., 43c; Ashland, Ky., 47c; Atlanta, 51c; Bethlehem, Pa., 52c; Birmingham, 50c; Brackenridge, Pa. 53c; Buffalo, 83c; Butler, Pa., 63c; Canton, O., 51c; Chicago (including Gary, Ind.), $1.34; Cincinnati (including Newport, Ky.), 65c; Claymont, Del. (including Chester, Pa.), 79c; Cleveland, 76c; Coatesville, Pa., 50c; Conshohocken, Pa., 26c; Detroit, 95c; Duluth, Minn., 50c; Harrisburg, Pa., 31c; Houston, 37c; Johnstown, Pa. 73c; Kansas City, Mo., 78c; Kokomo, Ind., 51c; Middletown, O., 26c; Midland, Pa., 75c; Minnequa, Colo., 33c; Monessen, Pa., 51c; Phoenixville, Pa., 51c; Pittsburg, Calif., 85c; Pittsburgh (including Bessemer, Homestead, Duquesne, Munhall), 99c; Portland, Oreg., 52c; Portsmouth, O., 51c; St. Louis (including Federal, Granite City, E. St. Louis, Madison, Ill.), 51c; San Francisco (including So. San Francisco, Niles, Oakland), 66c; Seattle, 59c; Sharon, Pa., 73c; Sparrows Point, Md., 26c; Steubenville, O., 51c; Warren, Pa., 73c; Weirton, 70c; Youngstown, 73c.

HAMILTON, ONT.

(Delivered Prices)

Heavy Melt	$35.00
No. 1 Bundles	35.00
No. 2 Bundles	35.00
Mechanical Bundles	31.50
Mixed Steel Scrap	31.00
Mixed Borings, Turnings	32.00
Rails, Remelting	35.00
Rails, Rerolling	38.00
Bushelling	29.50
Bushelings, new factory:	
Prep'd	33.00
Unprep'd	31.00
Short Steel Turnings	32.00
Cast Iron Grades*	
No. 1 Machinery Cast	55.00

* F.o.b. shipping point

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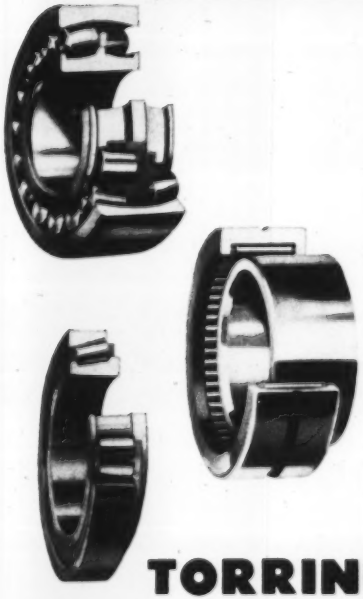

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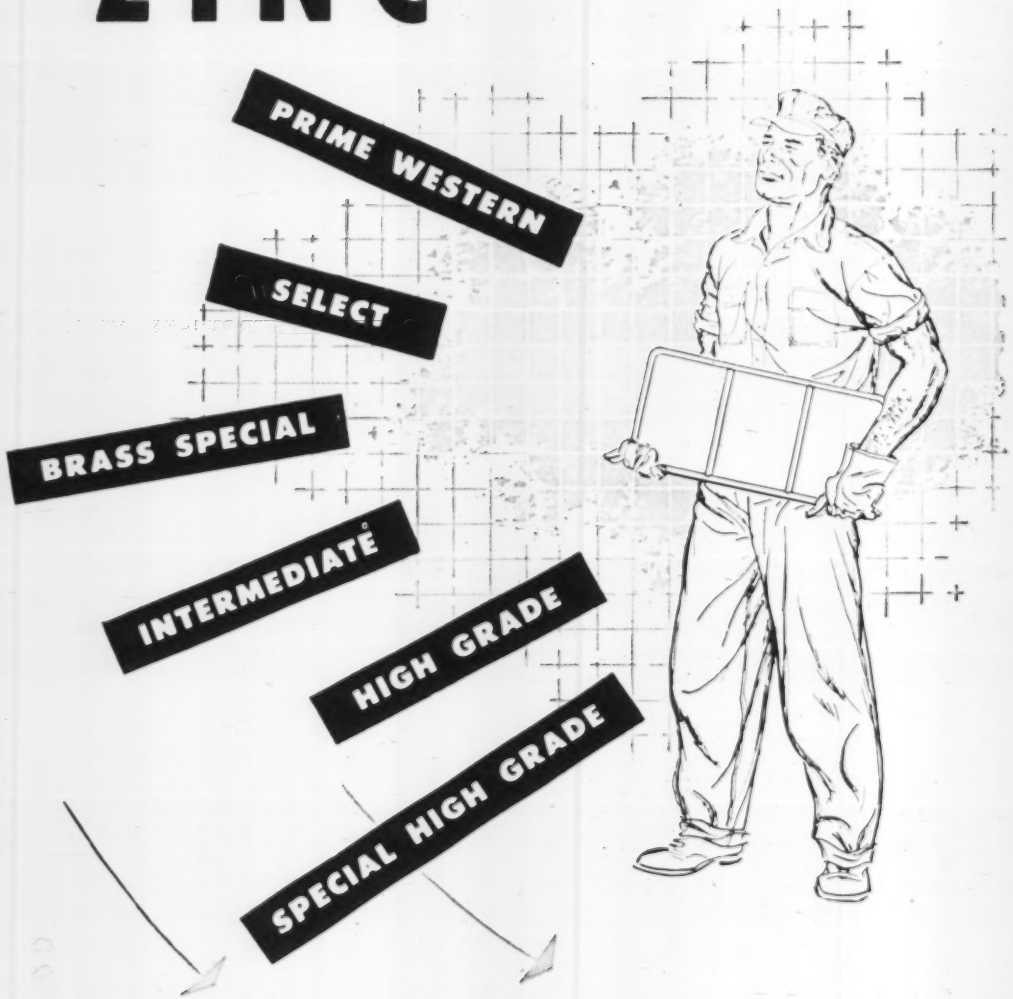

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The Metal Market

Limitations on use of many major nonferrous metals, particularly lead and aluminum, ease as supplies increase and military requirements are rescheduled

RELAXATION of restrictions on the use of nonferrous metals is gaining momentum. The trend is well under way and is expected to be pronounced after midyear.

In the case of lead and zinc, larger supplies of foreign metal are available as a result of elimination of premiums offered by consumers abroad. The premium paid for copper in the foreign market also has declined sharply, although going prices still preclude any large imports into this country. Expansion of aluminum production facilities is furnishing the metalworking industries with a steadily increasing supply of that metal.

The lead supply situation has improved to such an extent that National Production Authority is expected to relax restrictions on its use and to allow consumers to accumulate larger reserves. This action is expected to be taken by amending order M-38. This agency has revoked order M-93 which, effective Mar. 1, would have limited production of electric storage batteries to models having life expectancies of at least 18 months and would have prohibited output of high ampere-hour "deluxe" models.

Copper Outlook Improves

Improvement in metal supplies is extending to copper, one of the most critical of all materials. Negotiating with officials of International Materials Conference, Chilean government is seeking an increase of 6 cents a pound in the price of copper exported to the United States. If the advance is approved, Chile is expected to renounce its agreement with United States copper-producing companies in Chile under which 20 per cent of Chile's output is set aside for sale in the world market. Should the price advance fail of approval, Chile may level an export tax of 6 cents a pound on copper. Current price of Chilean copper is 27.50c here, reached by agreement nearly a year ago. Chile has been selling at prices around 54.50c on the foreign market, compared with recent sales of other foreign copper at 40.00c a pound.

In another step to increase copper supplies, Defense Materials Procurement Agency signed an agreement with White Pine Copper Co., subsidiary of Copper Range Co., Painesdale, Mich., which, along with a recently-announced loan of $57,185,000 by Reconstruction Finance Corp., will increase the annual domestic output of copper by 36,000 tons.

DMPA guarantees the company a price of 25.50c a pound f.o.b. Connecticut Valley, for 243,750 tons of the first 275,000 tons of copper produced by the new facilities. The agency has an option to purchase the entire output of the project over the contract period ending Dec. 31, 1961. The new facilities are expected to be in full production by the end of 1954.

This is the fifth agreement DMPA has reached with producers to step up production of refined copper, and brings to 145,000 tons the total annual increase in domestic production of the metal resulting from these agreements.

Calumet Mines—Automakers are considering a proposal by Michigan's Governor Williams which would put two now-idle copper mines back in operation. The two mines, owned by Calumet & Hecla Consolidated Copper Co., in Michigan's Upper Peninsula near Calumet, have been closed since 1938 and are flooded. Officials of the copper company estimate these mines could yield 45 to 50 million pounds of copper a year when restored to production.

Cost of pumping them out would be in the neighborhood of $19 million, an expenditure which would be justified only if a premium price could be obtained for the output. This is where the automakers come in. Governor Williams suggests that the auto industry guarantee the market for the copper, if federal approval can be obtained for an over-the-ceiling premium estimated at 3 to 5.5 cents a pound. With this guarantee in hand, the next step would be to borrow from government stockpile enough copper to permit higher automobile output. Subsequently the stockpile would be replenished by output from the reopened mines. On the basis of this guarantee, financing the cost of the reclamation operation might be through private or public channels.

None of the automakers has replied to the proposition. Some automakers have become associated in somewhat similar projects involving steel when they provided funds to permit mill expansion on the assurance of a continuing market for the output. In view of the urgent need for copper, they are giving this latest proposal serious study.

Brass Sheet Inquiry Eases

Demand for certain brass mill products is less pressing. Inquiry for brass sheet and strip has eased to such an extent some mills are no longer producing them at full capacity. This decline in new orders is attributed mainly to cutbacks in production of civilian goods, especially autos, household appliances, hardware and plumbing goods. Overall demand for brass mill products is active, however. About 50 per cent of the copper being produced is going into military equipment and, to meet requirements of this program withdrawals may be made from the government's stockpile.

OPS issued order No. 127 establishing ceiling prices on brass and bronze ingots, effective Mar. 3, at levels quoted by most sellers since Jan. 28.

Aluminum Supply Increases

Estimates of aluminum supplies for 1952 have been revised upward by NPA in the light of recent developments to a total of 1,365,000 tons. The quarter totals are estimated at 320,000 tons in each of the first two quarters, 355,000 tons in the third and 370,000 tons in the fourth.

Producers urge NPA to consider promptly an increase in allotments of aluminum in the second quarter of this year to specific segments of civilian industry to minimize unemployment and economic hardship. They point out that aluminum allotments authorized by DPA greatly exceed the quantity of orders placed with mills. They also note that in many cases material in fabricators' plants is more than adequate to meet authorized CMP allotments.

Producers call attention to the recent cutbacks in aircraft production goals as well as the extension of the military program over a longer period than had been anticipated originally. They urge that a portion of the aluminum made available by these developments be promptly channeled by NPA to those civilian industries which have suffered as a result of curtailed allotments of the metal. These uses include in part: building materials, utensils, motor vehicles, refrigerator parts, and chemicals (pigment).

Kaiser Aluminum & Chemical Corp., Oakland, Calif., raised its primary aluminum production goal beyond the 400,000-ton-a-year mark by authorizing immediate construction of additional facilities at its Tacoma, Wash., reduction plant.

The plant's current output will be increased 33 per cent from an annual capacity of 25,000 tons to 33,200 tons a year. The Tacoma increase and new capacities at Kaiser Aluminum's other primary aluminum plants at Spokane, Wash., and New Orleans will boost the company's overall capacity 137 per cent over last year's production.

Tin Purchase Price May Rise

Developments in negotiations between the United States and Indonesian tin representatives indicate that a price of around $1.25, New York, eventually will be established. Under provisions of the Anglo-American agreement, the British would receive automatically an equivalent increase over the original contract price of $1.215 a pound. The Indonesian contract will call for delivery of about 16,000 tons compared with 20,000 tons in the British agreement.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c, Conn. Valley; Lake 24.62½c, delivered.

Brass Ingots: 85-5-5-5 (No. 115) 27.25c; 88-10-2 (No. 215) 40.00c; 80-10-10 (No. 305) 33.00c; No. 1 yellow (No. 405) 23.25c.

Zinc: Prime western 19.50c; brass special 19.75c, intermediate 20.00c, East St. Louis; high grade 20.85c, delivered.

Lead: Common 18.80c; chemical 18.90c, refining 18.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 19.00c, pigs 18.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 20.50c; No. 12 foundry alloy (No. 2 grade) 19.50c; steel deoxidizing grades, notch bars granulated or shot, (Grade 1) 18.80c; grade 2, 18.60c; grade 3, 18.40c; grade 4, 18.20c.

Magnesium: Commercially pure (99.8%+) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 121.50c.

Antimony: American 99.90-99.8% and over but not meeting specifications below 50.00c; 99.8% and over, arsenic 0.05% max., other impurities 0.1% max., 50.00c, f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 56.50c; 25-lb pigs, 59.15c; XX nickel shot, 60.15c; "F" nickel shot or ingots for addition to cast iron, 56.50c. Prices include import duty.

Mercury: Open market, spot, New York, $203-$207 per 76-lb flask.

Beryllium Copper: 3.75-4.25% Be, $1.56 per lb of alloy, f.o.b. Reading, Pa.

Cadmium: Regular straight or flat forms, $2.55 del; special or patented shapes $2.80.

Cobalt: 97.99%, $2.40 per lb for 500 lb (keg); $2.42 per lb for 100 lb (case); $2.47 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 88.00c per oz.

Platinum: $90-$93 per ounce from refineries.

Palladium: $24 per troy ounce.

Iridium: $200 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Ceiling prices, cents per pound, f.o.b. mill, effective Aug. 23, 1951)

Sheet: Copper 41.68; yellow brass 38.28; commercial bronze, 95% 41.61, 90% 41.13; red brass, 85% 40.14, 80% 39.67; best quality 39.15; nickel silver, 18% 53.14; phosphor-bronze grade A, 5% 61.97.

Rod: Copper, hot-rolled 37.53, cold-drawn 38.28; yellow brass free cutting 32.63; commercial bronze 95% 41.30, 90% 40.82; red brass 85% 39.83, 80% 39.36.

Seamless Tubing: Copper 41.72; yellow brass 41.20; commercial bronze, 90% 43.79; red brass, 85% 43.06.

Wire: Yellow brass 38.57, commercial bronze, 95% 41.90, 90% 41.42; red brass, 85% 40.43, 80% 39.96, best quality brass 39.44.

(Base prices, effective Dec. 26, 1951)

Copper Wire: Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 28.54c; 30,000 lb lots, 28.67, l.c.l. 29.17. Weatherproof, 100,000 lb, 30.45; 30,000 lb, 30.60, l.c.l. 31.10. Magnet wire del. 15,000 lb or more 34.50, l.c.l. 35.25.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders)

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range Inches	Widths of Sheet In.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle†
0.249-0.136	12-48	30.1		
0.135-0.096	12-48	30.6		
0.095-0.077	12-48	31.2	29.1	33.2
0.076-0.061	12-48	31.8	29.3	33.4
0.060-0.048	12-48	32.1	29.5	33.7
0.047-0.038	12-48	32.5	29.8	34.0
0.037-0.030	12-48	32.9	30.2	34.6
0.029-0.024	12-48	33.4	30.5	35.0
0.023-0.019	12-36	34.0	31.1	35.7
0.018-0.017	12-36	34.7	31.7	36.6
0.016-0.015	12-36	35.5	32.4	37.6
0.014	12-24	36.5	33.3	38.9
0.013-0.012	12-24	37.4	34.0	39.7
0.011	12-24	38.4	35.0	41.2
0.010-0.0095	12-24	39.4	36.1	42.7
0.009-0.0085	12-24	40.6	37.2	44.4
0.008-0.0075	12-24	41.9	38.4	46.1
0.007	12-18	43.3	39.7	48.2
0.006	12-18	44.8	41.0	52.8

*Lengths 72 to 180 inches. †Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Dec. cts. per Round or distance across flats	Round H317-T4	Hexagonal R-317-T4	Hexagonal 178-T4
0.125	52.0		
0.126-0.218	44.0		
0.219-0.313	41.5		
0.375	40.0	46.0	48.0
0.406	40.0		
0.438	40.0	46.0	48.0
0.469	40.0		
0.500	40.0	46.0	48.0
0.531	40.0		
0.562	40.0		45.0
0.594	40.0		
0.625	40.0	43.5	45.0
0.688	40.0		43.0
0.750-1.000	39.0	41.0	42.5
1.062	39.0		41.0
1.125-1.500	37.5	39.5	41.0
1.562	37.0		
1.625	36.5		39.5
1.688-2.000	36.5		

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $24.00 per cwt; add 50c cwt 10 sq ft to 140 sq ft. Pipe: Full coils $24.00 per cwt. Traps and bends: List prices plus 65%.

ZINC

Sheets 26.50c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 25.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 25.50-26.50c; over 12-in., 25.50-26.50c.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 77.00c. Strip, cold-rolled, 84.00c. Rods and shapes, 73.00c. Plates, 75.00c. Seamless tubes, 106.00c.

MONEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 60.50c. Strip, cold-rolled 63.50c. Rods and shapes, 58.50c. Plates, 59.50c. Seamless tubes, 93.50c. Shot and blocks, 53.50c.

MAGNESIUM

Extruded Rounds 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars $6.

DAILY PRICE RECORD

1952	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Feb. 1-28	24.50	18.80	19.50	121.50	19.00	50.00	56.50	88.00
Jan. Avg.	24.50	18.80	19.50	109.404	19.00	50.00	56.50	88.00
Jan. 22-31	24.50	18.80	19.50	121.50	19.00	50.00	56.50	88.00
Jan. 2-21	24.50	18.80	19.50	103.00	19.00	50.00	56.50	88.00
1951								
Dec. Avg.	24.50	18.80	19.50	103.00	19.00	50.00	56.50	88.00
Nov. Avg.	24.50	18.80	19.50	103.00	19.00	44.56	56.50	88.00
Oct. Avg.	24.50	18.726	19.426	103.00	19.00	42.00	56.50	88.12
Sept. Avg.	24.50	18.50	17.50	103.00	19.00	42.00	56.50	90.16
Aug. Avg.	24.50	18.50	17.50	103.00	19.00	42.00	56.50	90.16
July Avg.	24.50	18.50	17.50	106.00	19.00	42.00	56.50	90.16
June Avg.	24.50	18.50	17.50	117.962	19.00	42.00	56.50	88.492

NOTE: Copper: Electrolytic del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western E. St. Louis; Tin, Straits del. New York; Aluminum primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery, unpacked. Silver, open market, New York. Prices, cents per pound, except silver, cents per ounce.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads, 28.00c; 5 tons and over 28.50c; 1 to 5 tons, 29.00c; less than 1 ton 29.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat, rolled, 38.50c; oval 37.50c.

Nickel Anodes: Rolled oval, carbonized, carloads, 74.50c; 10,000 to 30,000 lb 75.50c; 3000 to 10,000 lb, 76.50c; 500 to 3000 lb 77.50c; 100 to 500 lb, 79.50c; under 100 lb, 82.50c; f.o.b. Cleveland.

Nickel Chloride: 36.50c in 100 lb bags; 34.50c in lots of 400 lb through 10,000 lb; 34.00c over 10,000 lb, f.o.b. Cleveland, freight allowed on 400 lb or more.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 86.7c; 100 or 350 lb drums only, 100 to 600 lb 71.6c, 700 to 1900 lb, 69c, 2000 to 9000 lb, 67.3c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Tin Anodes: Bar, 5000 lb and over, $1.375; 500 to 999 lb, $1.38; 200 to 499 lb, $1.385; less than 200 lb, $1.40. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Zinc Cyanide: 100 lb drums, less than 10 drums 54.30c, 10 or more drums, 52.30c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb $1.11; more than 2000 lb, $1.06. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Stannous Chloride (Anhydrous): In 400 lb bbl, 98.5c; 100 lb kegs 99.5c. Freight allowed.

Scrap Metals

Brass Mill Allowances

Ceiling prices in cents per pound for less than 20,000 lb, f.o.b. shipping point, effective June 26, 1951.

	Clean Heavy	Red Ends	Clean Turnings
Copper	21.50	21.50	20.75
Yellow Brass	19.125	18.875	17.875
Commercial Bronze			
95%	20.50	20.25	19.75
90%	20.50	20.25	19.75
Red Brass			
85%	20.25	20.00	19.375
80%	20.125	19.875	19.375
Muntz metal	18.125	17.875	17.375
Nickel silver, 10%	21.50	21.25	19.75
Phos. Bronze, 5%	25.25	25.00	24.00

Copper Scrap Ceiling Prices

(Base prices, cents per pound, less than 40,000 lb f.o.b. point of shipment)

Group 1: No. 1 copper 19.25; No. 2 copper wire and mixed heavy 17.75; light copper 16.50; No. 1 borings 19.25; No. 2 borings 17.75; refinery brass, 17.00 per lb of dry Cu content for 50 to 60 per cent material and 17.25 per lb for over 60 per cent material. Group II: No. 1 soft red brass solids 18.50; No. 1 composition borings 18.25 per lb of Cu content plus 63 cents per lb of tin content; mixed brass borings 16.25 per pound of Cu content plus 60 cents per lb of tin content; unlined red car boxes 18.25; lined red car boxes 17.25; cocks and faucets 16.00; mixed brass screens 16.00; zincy bronze solids and borings 16.25.

Zinc Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment) Unsweated zinc dross 13.75c; new clippings and trimmings, 15.50c; engravers' and lithographers' plates, 15.50c; die cast slabs, min. 90% zinc, 13.75c; old zinc scrap, 12.25c; forming and stamping dies, 12.25c; new die cast scrap, 11.75c; old zinc die cast radiator grille, 11.50c; old die cast scrap, 10.50c.

Lead Scrap Ceiling Prices

(F.o.b. point of shipment)

Battery lead plates, 19.00c per lb of lead and antimony content, less smelting charge of 2 cents per lb of material in lots 15,000 lb or more; less 2.25c in lots less than 15,000 lb, or a flat price of 11.25c a pound of battery plates. Used storage batteries (in boxes; drained of liquid, 7.65c for 15,000 lb or more; 7.45c for less than 15,000 lb. Soft lead scrap, hard lead scrap, battery slugs, cable lead scrap or lead content of lead-covered cable scrap, 17.25c in lots of 20,000 lb or more; 16.50c in lots under 20,000 lb.

Aluminum Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment less than 5000 lb)

Segregated plant scrap: 2s solids, copper free 10.50; high grade borings and turnings, 8.50; No. 12 piston borings and turnings, 7.50; Mixed plant scrap: Copper-free solids, 10.00; dural type, 9.00; Obsolete scrap: Pure old cable 10.00; sheet and sheet utensils, 7.25; old castings and forgings, 7.75; clean pistons, free of struts, 7.75; pistons with struts, 5.75.

Tin Plate . . .

Tin Plate Prices, Page 162

Washington—National Production Authority plans to allot 68,000 tons of secondary tin mill products to can manufacturers for second quarter. Metal can order M-25 will be amended removing restrictions on use of tin mill accumulations, waste-waste, unmended menders and unassorted tempers. NPA also is considering an allotment of 35,000 tons of these products for first quarter.

Can inventories are better than year ago because military demands have not materialized, crop program goals have not been realized, and can quotas are not entirely taken by some customers. Industry inventories on Jan. 1 were 250,000 tons better than on Jan. 1, 1951.

An industry spokesman told NPA all can needs in 1952 can be satisfied under the restrictions of M-25 through use of 3,802,000 tons of steel. If quota restrictions are relaxed for the last 9 months of the year, total steel requirements will run to 4,133,000 tons.

Sheets, Strip . . .

Sheet and Strip Prices, Page 161 & 162

Chicago—Mills have full order books for second quarter and some commitments for third on flat rolled products. Order-wise the slackening in demand evident in other districts isn't visible here, but producers are aware cancellations and requests for delayed shipments can come on short notice.

Cleveland—Pressure for tonnage is less in evidence but the mills continue to book volume business. Order books are loaded through second quarter despite some cancellations, which, with few exceptions, have been taken up quickly by diversion of the cancelled tonnage to other consumers. The easiness in sheets is largely at the warehouse level, reflecting arbitrary cutbacks in automobile and appliance production.

Boston—With few exceptions consumers of flat-rolled, especially cold-rolled sheets and strip, are getting more steel and most now classify supply of these products as satisfactory. Hot-rolled sheets and galvanized are improving, but are not as free as cold-rolled.

New York—While there are indications of easing demand for light flat products, most sellers are fully booked for second quarter, barring a few specialties, such as low silicon sheets and straight chrome material. Some cancellations and deferments are noted.

Philadelphia—Many consumers of hot and cold-rolled sheets could use more tonnage if they could get more CMP tickets. On the other hand some buyers appear comfortably fixed on supplies. In some cases users have more tonnage than they need. Some shipments have been deferred and order cancellations are reported. However, there is no real surplus tonnage overhanging the market here.

Pittsburgh—Mills advise the key to the cold-rolled sheet picture during the next few months is what the automotive and domestic appliance

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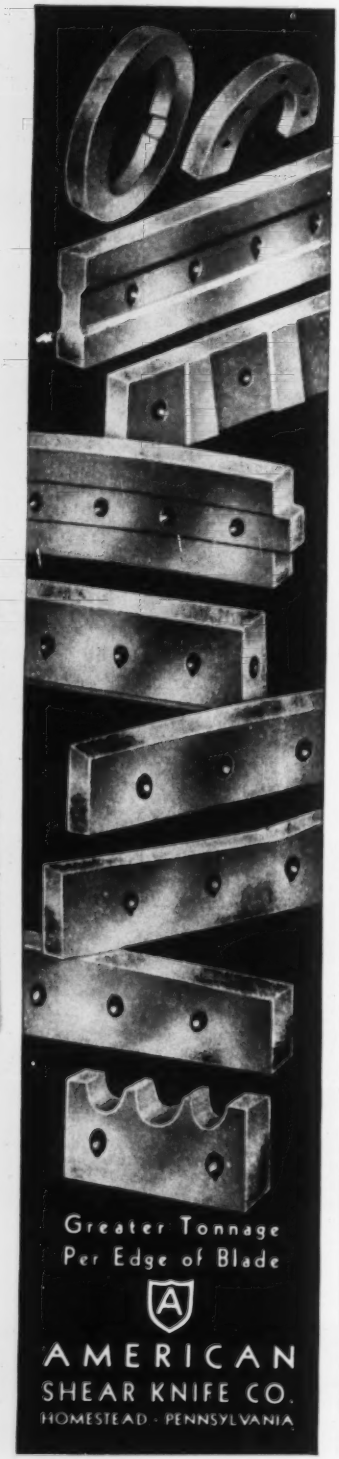


people do. District steelmen are watching spring automotive buying closely. Demand for silicon sheets is down due to restictions on copper to the electrical industry.

Birmingham — Despite reports of easing demand for flat rolled products elsewhere, no such development is noted here.

Semifinished Steel . . .

Semifinished Prices, Page 161

Pittsburgh — District steelmaking operations increased last week 2 points to 104 per cent of estimated capacity from last week's revised rate of 102 per cent. The Wheeling rate remained at 100.5 per cent which was last week's revised rate. One open-hearth furnace is down for rebuilding at Allegheny Ludlum's Brackenridge, Pa. plant. The company also has cut back on electric furnace production due to the decreased demand for silicon electrical sheets.

Johnstown, Pa.—Bethlehem Steel Co. ceased operations at the last three of four bessemer converters here Feb. 24. All steel at the plant will be made in 21 open hearths, some of which are being modernized. Once the modernization program is completed, steel production at Johnstown will be substantially increased. Bethlehem still has three converters in operation at Sparrows Point, Md.

Steel Bars . . .

Bar Prices, Page 161

Cleveland — If anything, supply conditions in the bar market are tighter. Sellers are booked solidly through second quarter and substantial tonnage is being turned away. Numerous CMP tickets still are unhonored for the period. Chief difficulty arises from the fact military requirements continue to expand and bar mill capacity has not been enlarged apace with demand in recent years.

Boston—Carbon bar users experience difficulty in placing authorized tickets for second quarter, notably in larger size quality grades. Inventories are more unbalanced. Forging quality bars are sold out through second quarter. Exceptions to extended schedules are tool steel bars.

New York— Pressure for carbon bars is strong. Leading producers declare demand for hot and cold carbon bars is stronger than for any other major items. Books have not yet been opened for third quarter on hot rolled bars, but virtually all sellers are accepting orders for that position for cold-drawn material. Some are entering tonnage for fourth quarter.

Philadelphia— Inquiry for bars is strong and highly diversified, topped off by active shell requirements affecting the larger sizes. Deferments and order cancellations are few. Sellers see no signs of any easing as result of the 1-year stretch out in military requirements.

Pittsburgh— Supply continues tight here with greatest demand for material 1½-in. and larger and also for hot-topped quality.

St. Louis—Concrete bars and merchant bars are in steadily worsening supply. CMP tickets exceed capacity. Mills are booked through second quarter, with some tonnage certain to overlap into third.

Plates . . .

Plate Prices, Page 161

Philadelphia—Although light gage plates are in freer supply, none is going begging. Heavy gages remain in strong demand. Requirements for the light gages would well exceed supply were more CMP tickets available.

Boston—More light plate tonnage and some improvement in heavier sizes has slightly eased pressure for carbon plates. Some consumers could use more second quarter tickets for hot-topped quality and low alloy plates.

New York—Pressure for light gage material is less than that for heavy gage, but plate producers are having no difficulty moving all the tonnage they can produce.

Pittsburgh—Demand for all gages of plates remains firm but the lighter gage product rolled on continuous hot strip mills is in much better supply than heavier gages rolled on conventional plate mills.

Cleveland—Light plates are in slightly better supply in this area as result of continuous mill production. However, there is no surplus tonnage. Sellers have no difficulty disposing of all available production. Some mills report they are turning away orders constantly. Also, they are receiving additional government directivec. Seasonal upturn in requirements is expected from some consuming directions shortly.

Birmingham—Reshuffling of plate allocations has taken some tonnage from carbuilders but has not resulted in any worthwhile free tonnage.

Portland, Oreg.—American Pipe & Construction Co. has 6500 tons of plates in jobs on books or nearing completion. Plate supply is easier.

Victoria, B.C. — An American freighter discharged 500 tons of Japanese steel plates here last week, consigned to Yarrows Ltd., shipyard.

Stainless Steel . . .

Stainless Steel Prices, Page 165

Washington — Partial exemption from the existing NPA requirement that alloy needs to be computed for each order submitted to Washington on monthly melt schedules, is urged by the NPA Stainless Steel Industry Advisory Committee. Exemption would save labor and paper work, and would eliminate duplication.

Partial decontrol of non-nickel bearing stainless steels has not yet increased orders for this grade. It will be several months before effects will be in evidence. By then consumers will have had time to redesign and "engineer" for non-nickel bearing steel.

NPA cautions the industry not to anticipate unlimited supplies of chromium due to uncertainty as to military requirements. Anticipated difficulties in producing sufficient type 431 nickel steel to meet a military aircraft commitment, due to

limited annealing and heat-treating facilities, have been overcome.

Supply of molybdenum for March is expected to approximate that in the first two months of the quarter. United States share of available free world nickel supply for second quarter is expected to equal that allotted by the International Materials Conference for first quarter.

Columbium and tantalum inventories have been built up substantially. Supplies now will support accelerated aircraft demand.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 161

Chicago—NPA's nod for resumption of construction on building already started and subsequently stopped bespeaks heavier demand for reinforcing products. Suppliers will feel the effect quickly. In many cases the steel tonnage was committed and it simply will be a matter of making shipments as steel becomes available.

Boston—Heavier demand for concrete reinforcing bars is accompanied by more direct buying by defense agencies, notably district Corps of Engineers.

Tubular Goods . . .

Tubular Goods Prices, Page 165

Portland, Oreg.—With 8900 tons of cast iron pipe in stock at Provo, Utah, where its plant is operating two shifts, Pacific States Cast Iron Pipe Co. has reduced prices.

Structural Shapes . . .

Structural Shape Prices, Page 161

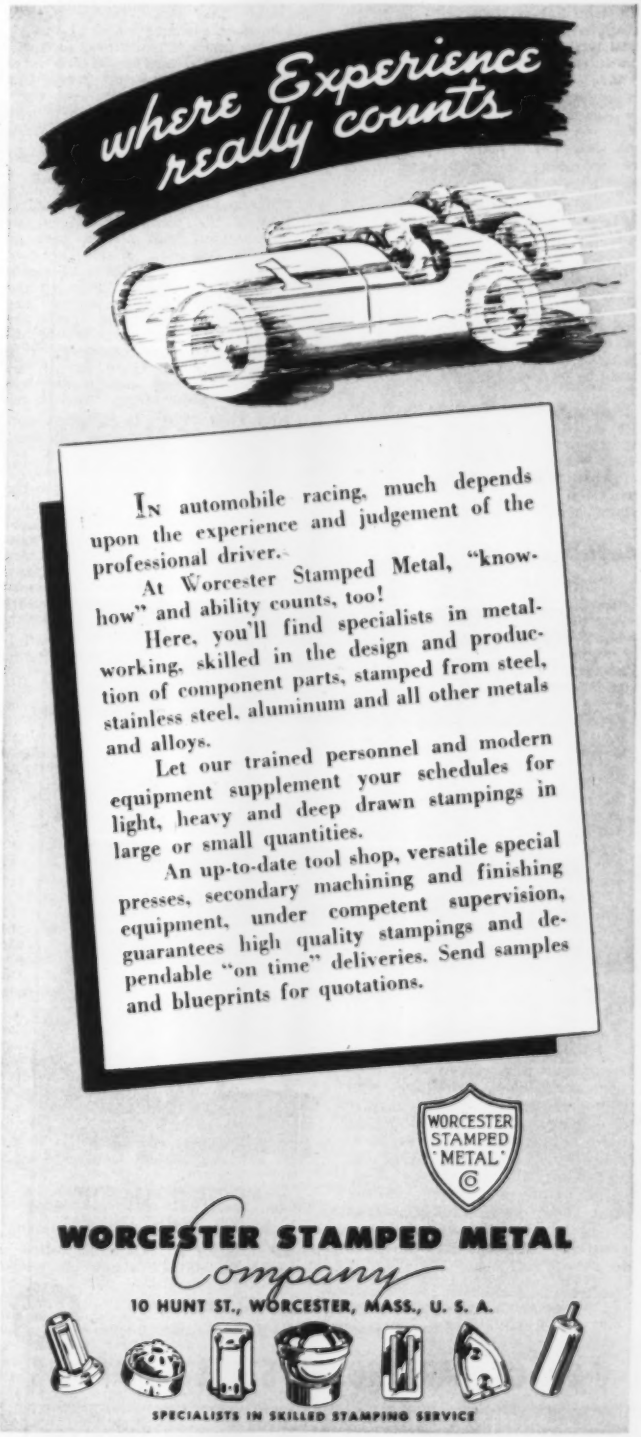
Philadelphia—Two recent measures easing government restrictions on building are welcomed by fabricators although still leaving much to be done if order backlogs are to be sustained. The first measure provides approval of more than 600 projects of public character, involving $218 million. The second allows for continuation of commercial work where it is 1 per cent under way, compared with 20 per cent previously. Shape producers' and fabricators' fingers are crossed with respect to second half operations.

Boston—Heavier inquiry for fabricated structural steel is developing. Bridges and direct defense building, notably air field shops and warehouses, are being brought out.

New York—Despite some indications Washington will ease restrictions on certain work, such as bridges, schools and institutional construction, structural demand continues spotty. It is unlikely there will be any appreciable easing for some weeks to come.

Pittsburgh—Structural shapes are rapidly approaching supply-demand balance. The picture looks much better to many due to NPA's latest order which gives the "go-ahead" to 645 religious, community and municipal building projects.

Chicago—After second quarter, structural fabricators fear operations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will drop unless NPA acts promptly in approving more construction jobs. Lead time involved in getting shapes scheduled with mills and shipped is a factor.

Portland, Oreg. Fabricating plants are busy on public works projects. Order backlogs are larger than normal. Supplies of some steel products are improving but structural items are difficult to obtain.

Wire . . .

Wire Prices, Page 163

Boston Including heading wire in screw and bolt sizes, buying of most wire products is geared to current production schedules. Bed spring manufacturers are operating below normal. In some cases more wire would be bought if tickets were available.

Birmingham Wire products are in fair supply although mill interests say there is no tonnage "to play with."

Pueblo, Colo. — Colorado Fuel & Iron Corp. is completing a $1 million expansion of wire facilities here.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 165

Cleveland—Something of a slight pickup in oven coke demand is noted by some sellers in this area reflecting signs of quickening activity in some of the light foundries that have been more or less in the doldrums for some time past. Further, part of the renewed demand is seen stemming from the desire of consumers to stockpile in anticipation of possible labor trouble in the coal industry late this spring after the current steel wage negotiations are out of the way.

Pig Iron . . .

Pig Iron Prices, Page 160

Cleveland—While pig iron requirements of the jobbing foundries are off, merchant iron sellers have no difficulty disposing of all the iron they have for sale. Where the needs of the lighter shops are curtailed, the heavy castings shops on defense and related work are taking increasing tonnage. Recently, government inspectors ordered foundries to keep closer watch on their inventories when it was found some shops were exceeding government limitations.

New York There is an appreciable price differential between pig iron and scrap in favor of the latter, but pig iron sellers are having no difficulty selling their output despite the lag in foundry operations.

Buffalo Tightness grips the merchant pig iron market here. Producers refuse to cut into basic iron production despite pressure from merchant consumers for more tonnage. It is estimated approximately 80 per cent of current production is going into ingots.

Philadelphia Despite sluggish operations at gray iron foundries, there is still an excess of pig iron demand. Two modest lots of Canadian iron have been purchased in this district at close to $70, delivered. The iron is a bessemer grade, produced at Hamilton, Ont.

Pittsburgh Demand continues to ease for pig iron due to curtailment of consumer casting programs. Heavy castings for defense account are strong. Some foundries have excellent inventories. It is expected a pickup in plumbing and heating castings will be felt soon due to the spring housing program. Reports of increased pattern shop activity are heard in the district.

Chicago Jobbing gray iron foundries continue on reduced operations. This is reflected in weaker demand for pig iron. The only favorable element in the outlook is relaxing of restrictions on building construction and anticipation that NPA will allow larger output of autos and consumer goods.

Birmingham Additional merchant iron resulting from expansion at Woodward Iron Co. and modernization of equipment at other points has not answered the supply problem in this district.

No. 5 blast furnace of Tennessee Coal & Iron Div., U. S. Steel Co., at Ensley, Ala., was returned to production 10 days ahead of schedule. The stack went down for relining Dec. 31.

Scrap . . .

Scrap Prices, Page 168

Pittsburgh The district's leading steel producer has a 4-day supply of open-hearth scrap and a 10-day supply of electric furnace material. Other producers have up to 15-days' stock. This is an improvement but the supply situation is far from good. Open-hearth grades and high quality electric furnace material are tight. Cast scrap is in good supply and while some below-ceiling sales are reported dealers handling the greater portion of the material report that no cut-price sales have been made to date. Upgrading is on the way out.

Philadelphia While there is a slight easing in steel scrap and a continued lag in cast grades, good grades of steel scrap remain scarce. Consumers are increasingly selective in their acceptances. Generally, it is believed steel scrap consumers are over the supply hump for the time being. Still freer supply conditions are expected this spring.

Cast grades are moving less actively. The cupola cast market has dropped below the $49 ceiling to around $47 to $47.50, shipping point. Unstripped motor blocks can be had for at least $2 to $3 a ton under the $43 ceiling.

Bids are expected shortly for demolition of the Broad Street station of the Pennsylvania railroad.

Boston — Steel scrap consumers complain of poor quality and upgrading. With most, supply is not quite as critical, but inventory margins are small. Industrial scrap produced is somewhat lower, but balanced to some degree by larger tonnage from automobile wrecking yards. Ceiling price for unprepared heavy melting steel is firm, but weakness continues in several cast grades.

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including cupola cast, $2 to $3 under ceiling. Foundries have good reserves of cast.

New York—Sellers' prices on cupola cast have been reduced $1.50 from the $49 ceiling price and a softer tone is reflected in other cast grades, all of which are moving slowly. Movement of steel scrap is a shade easier, but prices are steady.

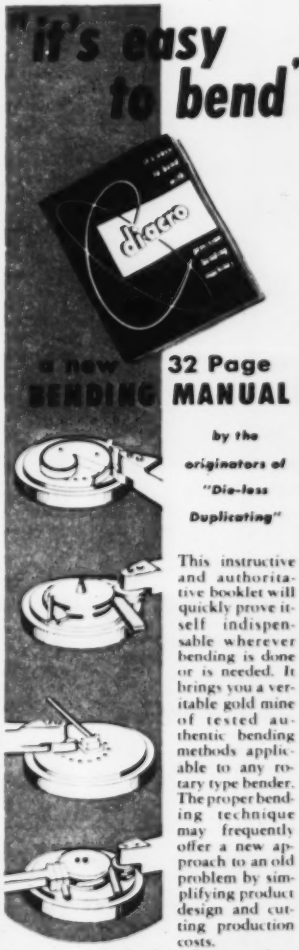
Buffalo—One of the leading mill consumers here again is in serious supply position. Despite favorable weather, dealers report drastic shrinkage in material moving into their yards. Even the weak cast scrap market has been bolstered by dwindling supplies. New business in this grade is reported at ceiling levels.

Detroit—Demand for good grade steelmaking scrap continues strong. Few traders see the possibility of anything except a long term scrap shortage. Mills and foundries are critical of quality. Because of this, and activity of OPS inspectors, material is more carefully prepared than it has been. No price cutting as such is reported on cast scrap. However, some dealers are selling cupola cast as charging box cast, the equivalent of a $2 per ton reduction. Ford is back in the market with inquiries for electric furnace and open hearth material. Electric furnace consumption is reported off, but most mills are trying to improve their inventory position.

Cleveland—Pressure for steel scrap is easier though supplies continue critically short. Mills have been able to enlarge inventories somewhat and are not pressing as frantically for tonnage. Favorable weather is a factor for steady shipments. Dealers, however, warn the flow of industrial scrap is restricted by manufacturing plant curtailments and that conditions are anything but healthy. Easier tone prevails on the cast grades and some shading of prices is reported, largely in the way of freight absorption. Heavier volume of motor scrap coming onto the market as result of government regulations affecting auto graveyard material is a factor for easiness in the cast grades. Foundry requirements also are off, but early stepup of production by the castings shops is seen in a pickup in pattern shop activity.

Chicago—Continuing easiness of cast scrap provides the only color in the market here. Prices of various grades vary widely from $2 to $5 below ceiling and curiously are set by steel mill buying for open hearth use. Gray iron foundries are virtually out of the market. Thus, material is accumulating to glutting proportions. Blast furnace grades are in little demand but ceiling prevails in occasional acquisitions. Steelmaking material retains its strength and despite capacity furnace operations is moving sufficiently well to exceed consumption by a small margin. Exceptionally good weather is given credit for the better flow, but the scales could tip with a reversal of conditions.

St. Louis—Steel scrap shipments are up a trifle but mills are unable to add to stockpiles. Mills are getting more particular on the dealers preparation of scrap and dealers regard this as the first sign of a softening of the supply stringency.



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Cast market is practically dead. Tonnage is readily available at $3 under ceiling.

Los Angeles—Cast scrap market is weaker. Sales are being made $2 to $3 per ton under ceiling. Scrap dealers say M-92 is bringing out only 15 per cent of potential auto scrap.

San Francisco — The cast scrap market presents a weak picture. Generally, prices of metropolitan generated-iron scrap are about $5 a ton under the ceiling. Dealers' yards are well stocked. Steel scrap supply still is critical, although dealers noted a slight slackening in demand for baled steel scrap.

Seattle — Steel scrap prices are softer, mills quoting $34 for No. 1 and No. 2 heavy melting, $3 under ceiling. The market is beared by the increase in cast iron supplies from auto wrecking yards, this item being $5 under ceiling.

Warehouse . . .

Warehouse Prices, Page 167

Chicago — Steady deliveries from mills, and somewhat lessened consumer demand are combining to restore warehouse operations to a more orderly basis. There is a mild improvement in stocks generally but particularly cold-rolled sheets and strip, wire products and some tubular items.

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Boston — Warehouse stocks are in better balance and most distributors are building inventories slightly in lighter gages of cold-rolled sheets, strip, light plates and structurals. Nail inventories are heavier. In some cases distributors with higher priced foreign steel have revised prices downward.

Philadelphia — Warehouse business is well sustained. Bars, plates and small shapes are in particularly short supply. Demand for sheets and strip is less pressing but distributors here have little difficulty moving tonnage.

Pittsburgh — Biggest problem facing district operators is unbalance size-wise in stocks. Receipts from mills have been improving. Heavy gage plates are extremely hard to secure as are galvanized sheets, bars and structural shapes.

Cleveland—Better inventory position of the steel warehouses is chiefly in the light, flat-rolled products. Light plates are somewhat freer, but bars and structurals continue scarce. In general, warehouse inventories continue unbalanced and most distributors would be doing heavier volume were their stocks rounded out.

Birmingham — Warehouses could move greater tonnage were it available. Plates are in especially short supply.

Portland, Oreg. — Plates are in shortest supply at district warehouses. Hot-rolled sheets are tight but cold-rolled are more readily available. Galvanized sheets are scarce. Bars are easier to obtain.

Los Angeles—Warehouse order volume is steady at the January level. Inquiries are reduced. Cold-rolled and hot-rolled flat items are easier but galvanized and plate products are tight.

Rails, Cars . . .

Track Material Prices, Page 163

Birmingham — Nashville, Chattanooga & St. Louis railroad placed an order with the Bessemer plant of Pullman Standard Car Co. for four hundred 50-ton hoppers.

Fluorspar . . .

Fluorspar Prices, Page 165

Los Angeles—Kaiser Aluminum & Chemical Corp. will construct a fluorspar mill at an undisclosed site in Nevada. The mill will receive fluorspar from the Baxter mine near Gabbs. Approximately 31,000 tons of acid grade fluorspar concentrates are required annually by Kaiser Aluminum for its primary aluminum plants at Spokane, Tacoma, Wash., and New Orleans, La.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

14,500 tons, New York Central bridge, Harlem river, New York, to American Bridge Co., Pittsburgh, recently noted as low bidder.

3080 tons, including plates, 32 spillway gates for McNary dam, to Gunderson Bros. Engineering Co., Portland, Oreg.

2500 tons, McNary and Lookout Point dams, Tacoma penstock and work for Washington Water Power Co., Spokane, Wash., to Willamette Iron & Steel Co., Portland, Oreg.

1500 tons (previously reported 1000 tons) stoplogs and other equipment, McNary dam, to Gunderson Bros. Engineering Co., Portland, Oreg.

650 tons, buildings and pier extension, Port of Portland, Oreg., to Gunderson Bros. Engineering Co., Portland.

600 tons, fishway gates and equipment, McNary dam powerhouse, to Premier Gear & Machine Works, Portland, Oreg.

400 tons, including plates, castings, etc., gate hoist cylinders McNary dam, to Premier Gear & Machine Works, Portland, Oreg.

320 tons, locomotive and car facilities building, Pennsylvania Railroad, West Morrisville, Pa., to Keystone Structural Steel Co., Camden, N. J.

311 tons, Vancouver, Wash. state overcrossing, to Poole, McGonigle & Dick, Portland, Oreg.

310 tons, school, Bucks county, Pennsylvania, to Reading Metalcraft Co., Reading, Pa.

208 tons, Johns river bridge, Washington state highway project, to Poole, McGonigle & Dick, Portland, Oreg.

143 tons, Coos river, Oregon state bridge, to Gunderson Bros. Engineering Co., Portland, Oreg.; Tom Lillibro, Reedsport, Oreg., general contractor.

130 tons, state highway bridge, Vernon, Conn., to Bethlehem Steel Co.; Brunalli Construction Co., Southington, Conn., general contractor; Truscon Steel Co., Boston, awarded reinforcing bars.

125 tons, office and manufacturing building, French Packing Co., Philadelphia, to Belmont Iron Works, Eddystone, Pa.

110 tons, state bridge, New Castle, Del., through James Julian, Elsmere, Del., to Bethlehem Steel Co.

100 tons, shapes and bars, junior high school, Watertown, Conn., to Berlin Construction Co., Berlin, Conn., and Sherer Steel Co., Hartford; Massacoe Builders Inc., Simsbury, Conn., general contractor.

STRUCTURAL STEEL PENDING

1600 tons, galvanized transmission towers for Bonneville Power Administration, Portland, Oreg.; Bethlehem Pacific Coast Steel Corp., Seattle apparently low, $1,174,484.

3600 tons, estimated, railroad and highway bridges, Fore river, Portland, Me.; bids expected in April.

2800 tons, state hospital additions, Central Islip, N. Y.; bids opening Mar. 16 on an infirmary requiring about 800 tons and on Mar. 26 on two additional buildings, Nos. 127 and 128, requiring 2000 tons.

2000 tons, including bar joists, four warehouses, advance base, Quonset Point naval base, Davisville, R. I.; bids Mar. 11.

632 tons, state bridge work, Newark, N. J.; bids Mar. 13.

240 tons, Wishington state bridge, Cowlitz county; general award to Lockyear & White, Longview, Wash., low $207,500.

208 tons, building addition, air base, Limestone, Me.; bids to Corps of Engineers, Boston.

150 tons, state highway bridge, Raynham, Mass., Fall River expressway; bids Mar. 4, Department of Public Works, Boston.

125 tons, miscellaneous construction, Du Pont interests, Edgemoor, Del.; bids Mar. 5.

100 tons, electric truck building, Wyman-Gordon Co., Worcester, Mass.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1255 tons, research laboratory building, air field, Bedford, Mass., to Bethlehem Steel Co.; through Corps of Engineers, Boston.

1000 tons, quartermaster research laboratory, Natick, Mass., to Truscon Steel Co., Boston, through Corps of Engineers, that city.

535 tons, structures, air base, Limestone, Me., to Bancroft & Martin Rolling Mills Co., Portland, Me. through Corps of Engineers, Boston; about 1 million square feet welded reinforcing mesh awarded jointly to same fabricator and Wickwire-Spencer Steel Co., Boston.

700 tons, housing project 200-112, West Roxbury-Jamaica Plains district, Boston, to Concrete Steel Co., Boston; S. & A. Allen Construction Co., Boston, general contractor.

540 tons, Wills Creek channel improvement, Cumberland, Md., to United States Steel Supply Div., U. S. Steel Co., Chicago.

340 tons, Prospect dial office, Illinois Bell

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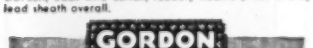

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Telephone Co., to United States Steel Supply Div., U. S. Steel Co., Chicago.

500 tons, Perry blast furnace reconstruction, Interlake Iron Corp., Erie, Pa., to United States Steel Supply Div., U. S. Steel Co., Chicago.

285 tons, bridge, Oakland, Providence, R. I., to Pianations Steel Co., Providence; bought direct on bids to state.

150 tons, John Corcoran housing project PHA 3-2, Cambridge, Mass., to Bethlehem Steel Co.; S. Volpe & Co, Inc., Boston, general contractor.

100 tons, school building, Milford, Conn.; 65 tons of bars to Fox Steel Co., Orange, Conn., and 35 tons of shapes to Port Chester, Iron Works, Port Chester, N. Y.; John Zandonella, Bridgeport, general contractor.

REINFORCING BARS PENDING

1500 tons, mostly in deck, three sections, Boston Arterial highway; bids Mar. 18, Mar. 25, and Apr. 1.

1200 tons, ammunition storage facilities, Blue Grass Ordnance Depot, Richmond, Ky.

500 tons, dam, Jamestown, N. Dak.

200 tons, Alexander Ramsey high school, Ramsey county, Minnesota.

257 tons, East Dentistry, Medicine and Pharmacy building, University of Illinois, Chicago.

240 tons, state highway structures, Raynham-Bridgewater and West Bridgewater, Mass.; bids Mar. 4.

180 tons, bridge, Butler, Pa.

150 tons, expansion, Iowa Public Service Co., Storm Lake, Iowa.

117 tons, state bridge work, Newark, N. J., bids Mar. 13.

115 tons, Washington state overcrossing, Chelan county; general contract to A. W. Stevens Contracting Co., Burlington, Wash.

100 tons, expansion, Newport News Ship Building & Dry Dock Co., Newport News, Va.

100 tons, hospital, Shakopee, Minn.

100 tons, expansion, Big Chief Mfg. Co., Hutchinson, Kans.

PLATES . . .

PLATES PLACED

4250 tons, including 1400 tons shapes, 23 Navy barges, to Gunderson Bros. Engineering Co., Portland, Ore.

3000 tons, 600 pots, ⅝ and ¾ inch, for Aluminum Co. of America, Wenatchee, Wash.; to American Pipe & Construction Co., Portland, Oreg.

2000 tons, 70 and 80 inch penstocks for California-Oregon Power Co., Clearwater projects Nos. 1 and 2, to American Pipe & construction Co., Portland, Oreg.

1500 tons, piling for Port of Portland terminal expansion, to Beall Pipe & Tank Co., Portland, Oreg.

1300 tons, 78 to 32 inch water supply pipe for Tacoma, Wash., to American Pipe & Construction Co., Portland, Oreg.

1000 tons, 20-foot diameter penstock for Big Cliff dam, to American Pipe & Construction Co., Portland, Oreg.; Consolidated Builders, general contractors.

345 tons, ocean going barge, for Oahu Railroad & Land Co., Honolulu, T. H., to Gunderson Bros. Engineering Co., Portland, Oreg.

200 tons, stack, power station, Pennsylvania Power & Light Co., Martins Creek, Pa., to Bethlehem Steel Co.

PLATES PENDING

300 tons, 730,000-gallon standpipe, Galena, Ill.; bids Mar. 7, alternate on 525,000-gallon capacity unit.

100 tons, Corps of Engineers, Louisville, Ky.; bids Mar. 3.

PIPE . . .

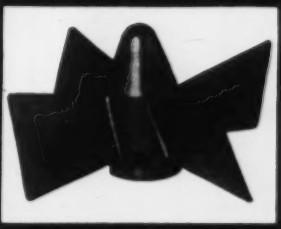
CAST IRON PIPE PENDING

Unstated, 19,800 feet of 10 and 8 inch water pipe (half to be furnished by contractor); also 825,000-gal. concrete or steel reservoir; bids to Ft. Lewis, Washington, about Mar. 20; Western Engineers, Arctic Bldg., Seattle, designers.

Unstated, 32,000 feet of 8 and 6 inch cast iron pipe; also 5000 ft 12 inch steel pipe; tenders also for two reservoirs, 1½ million gallons total capacity; bids to Wolf Creek water district, Portland, Oreg. Mar. 4.

Unstated, 25,000 feet 4 inch cement lined pipe and accessories, bids to Milton, Wash., Mar. 10.

Rocket Fuse



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Continued from Page 54

Ill., will get 480,000 net tons annually of open-hearth steel from three new furnaces, in the second quarter of 1953.

GREEN RIVER STEEL CO., Owensboro, Ky., will get 167,000 net tons of electric steel annually from two new furnaces, in June, 1953.

INLAND STEEL CO., Indiana Harbor, Ind., will get 750,000 net tons annually from four new open-hearth furnaces, in the third quarter of this year. It will also get an additional 125,000 tons annually from open-hearth furnace enlargements in 1953.

JONES & LAUGHLIN STEEL CORP., will get 300,000 net tons annually from four new open hearths at Pittsburgh, in March of this year. J. & L. will retire three bessemers and six 50-ton open hearths this year, cutting its Pittsburgh Works capacity 800,000 tons.

JUDSON STEEL CORP., Emeryville, Calif., will get 43,500 net tons annually from enlargement of open hearths and perhaps installation of electric furnaces, but a date is not set.

LATROBE ELECTRIC STEEL CO., Latrobe, Pa., is considering additional facilities for electric steel, probably next year.

R. G. LeTOURNEAU INC. will get 30,000 net tons of steel annually from one new electric furnace at Longview, Tex., beginning March, 1952, and 60,000 net tons of steel annually from two new electric furnaces beginning July, 1952, and January, 1953.

LONE STAR STEEL CO., Lone Star, Tex., will get 500,000 net tons of open-hearth steel annually from four new furnaces, beginning in the fourth quarter of 1952.

LUKENS STEEL CO., Coatesville, Pa., is considering an electric furnace project.

MIDVALE CO., Philadelphia, will get 49,291 net tons of open-hearth steel annually from one new furnace beginning March, 1952.

GREAT LAKES STEEL CORP., at Ecorse, Mich., will get 580,000 net tons of open-hearth steel annually in 1952 from furnace enlargements and another 350,000 net tons of open-hearth steel annually in 1953 from furnace enlargements.

NEWPORT STEEL CORP., Newport, Ky., will get 144,000 net tons of steel beginning December, 1952, from one new electric furnace and conversion of an existing electric furnace.

NORTHWESTERN STEEL & WIRE CO., Sterling, Ill., will get 504,000 net tons of steel a year, beginning June, 1952, from two new giant electric furnaces.

PACIFIC STATES STEEL CORP., Niles, Calif., will get 80,000 net tons of open-hearth steel annually from two new furnaces.

PITTSBURGH STEEL CO., at Monessen, Pa., will get 488,000 net tons of open-hearth steel annually in 1952 from four furnaces to be enlarged.

REPUBLIC STEEL CORP., at South Chicago, Ill., will get 48,000 net tons of electric furnace steel annually from conversion of a furnace to top charging, and 675,000 net tons of open-hearth steel yearly beginning June, 1952, from four new furnaces at Cleveland.

SEIDELHUBER STEEL ROLLING MILL CO., Seattle, will get 225,000 net tons of steel annually from one new electric furnace, beginning in 1953.

TENNESSEE STEEL CORP., Oneida, Tenn., will get 192,000 net tons of steel from two new electric furnaces. Additionally there will be one small furnace for research.

TIMKEN ROLLER BEARING CO., Canton, O., will get an annual production of 275,000 net tons of steel, beginning in the third quarter, 1952, from three new electric furnaces which will replace three open-hearth furnaces of 201,600 tons capacity.

For UNITED STATES STEEL CO., Tennessee Coal & Iron Div., at Fairfield, Ala., will get 500,000 net tons of open-hearth steel annually from two new furnaces and improvement of existing facilities in 1953. United States Steel Co., at Morrisville, Pa., will get 1.8 million net tons of open-hearth steel annually from nine new furnaces, beginning in the third quarter, 1952.

VANADIUM ALLOYS STEEL CO. will get 5300 net tons of steel annually, beginning in January, 1953, from one new furnace at Monaca, Pa., to replace an old furnace.

COLONIAL STEEL CO., Monaca, Pa., will get 12,500 net tons of steel a year from one new electric furnace, in 1952.

WEST VIRGINIA STEEL & MFG. CO., Huntington, W. Va., will get 87,000 net tons of steel annually from one new electric furnace, beginning in the second quarter of 1952.

WHEELING STEEL CORP. will have two bessemer converters with an annual capacity of 420,000 net tons in operation at Steubenville, O., in 1953.

YOUNGSTOWN SHEET & TUBE CO. will get 1,225,000 net tons of open-hearth steel in 1952 from eight new furnaces at East Chicago, Ind. They will replace two bessemer converters, leaving a net gain of 900,000 tons. Four of the open hearths will come in this spring, and the other four next fall.

NET TOTAL of the new additions, in net tons, is 10,907,561.

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Metalworking Briefs . . .

CONSTRUCTION—ENTERPRISE—ORGANIZATIONAL CHANGES

Rich Enlarges Facilities

In a continuing program of expansion, Rich Steel Co., Los Angeles, increased its warehousing facilities and general offices and added several new units of processing equipment. The company's processing facilities include additional shearing, roller leveling, slitting and edging equipment, plus a recently completed pickling and phosphate coating plant capable of treating over 100 tons of steel per day.

Container Output To Rise

American Can Co., New York, expects to have its multimillion dollar Stockton, Calif., plant in operation by May 1. The plant will have an annual rated capacity of 350 million metal containers.

Atlantic Steel Co. Expands

Atlantic Steel Co., Atlanta, will construct a $500,000 warehouse and office building at the corner of Northside drive and 14th street, that city, for its Warehouse Division. Larger facilities will be needed to accommodate the increased production to result from its new electric furnace which will be in operation soon.

National Foundry Buys Firm

National Malleable & Steel Castings Co., Cleveland, purchased all of the capital stock of Capitol Foundry Co., Phoenix, Ariz., and the latter's subsidiary, Arizona Iron Works. A $1.5 million program will be undertaken to expand and improve the Phoenix properties which will be operated as subsidiaries of National Malleable. Capitol will install electric smelting furnaces and other equipment to produce cast steel grinding balls and will expand its production of miscellaneous steel, iron and alloy castings. The company now produces white iron grinding balls, iron liners, grey iron castings, steel castings and a small tonnage of bronze and aluminum castings.

Kaiser To Boost Output

Kaiser Aluminum & Chemical Corp., Halethorpe, Md., recently installed new equipment and has plans for a still larger addition of production equipment which will increase the plant's output by about 25 per cent.

Dominion Steel Expanding

Dominion Steel & Coal Corp.'s $45 million modernization and expansion program in the maritime provinces of Canada is running right on schedule and will result in increased steel and coal output. Addition of two new open hearths at the Sydney, N. S., plant will lift steel output 120,000 tons a year.

Ford Contract Awarded

Ford Motor Co. of Canada Ltd., Windsor, Ont., awarded a contract to Anglin-Norcross Ontario Ltd., Toronto, for construction of an assembly plant near Oakville, Ont. The plant will have 32½ acres of floor area under a single roof. The contract involves an estimated expenditure of $17 million.

Korhumel Offers Tool Steel

Latrobe Electric Steel Co., Latrobe, Pa., appointed Korhumel Steel & Aluminum Co., Minneapolis, as its representative in that territory. Already well known as a steel distributor, this marks the entrance of Korhumel into tool steel warehousing business.

Polishing Facilities Expand

A 33 1/3 per cent expansion in production capacity is announced by Atlantic Polishing Mill, Chicago, through addition of new polishing equipment. The firm specializes in polishing all types of stainless steel sheets, plates, tubes, bars, brass, carbon steel, monel, etc.

Koppers Buys Storage Space

Koppers Co. Inc., Metal Products Division, Baltimore, acquired for storage purposes some 50,000 square feet at Jencks avenue and Oldham street, that city.

White Motor Builds on Coast

Construction is expected to get under way soon on a $750,000 regional headquarters building in San Francisco for White Motor Co., Cleveland. The structure, scheduled for completion by mid-1952, will be located at Fifth and Brannan streets.

Selas Opens Branch Office

Selas Corp. of America, heat processing engineers, Philadelphia, opened a Pittsburgh office at 3829 Willow Ave. under the direction of John L. Wilson.

Tool Firm Completes Project

Cleveland Industrial Tool Corp., Cleveland, completed a $700,000 building and equipment expansion program for further production of hydraulic diamond turners and high precision air-

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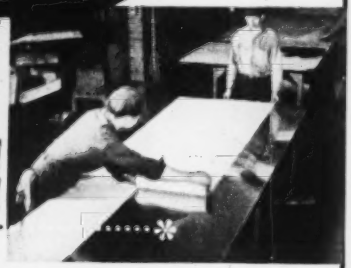

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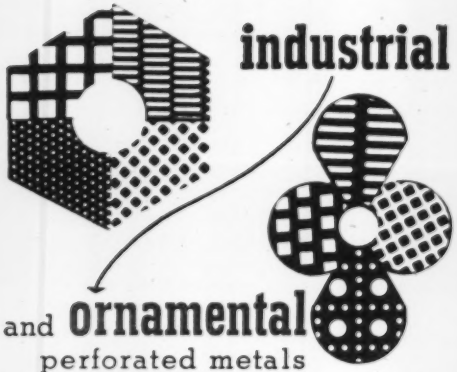

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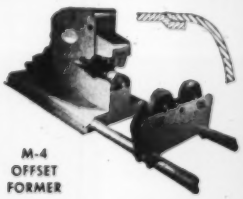

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craft parts. L. Red Zeman was appointed vice president and general manager of the company while Lee Loecy takes active charge of the Citco Diamond Tool Division. Walter Borsits was promoted to plant superintendent of the Aircraft Parts Division.

McDanel Builds Machine Shop

New construction, which will house an enlarged machine shop, is under way at McDanel Refractory Porcelain Co., Beaver Falls, Pa. The new building is scheduled for completion in April.

American Pullmax Moves

American Pullmax Co. Inc., Chicago, moved to larger quarters at 2455 N. Sheffield Ave., that city. The company sells sheet and plate working machines, lathes and milling machines, wire machines and flame cutters.

Slife Gets Truck Agency

Automatic Transportation Co., Chicago, appointed Robert M. Slife & Associates Inc., Cleveland, as its sales and service representative in that territory for its electric industrial trucks.

Westinghouse Renames Unit

Name of central station department of Westinghouse Electric Corp., Pittsburgh, was changed to electric utility department. The change applies to all elements of the Apparatus Division that formerly used the term "central station."

Stampings Firm Expands

An addition to Federal Tool & Mfg. Co.'s plant in Minneapolis was completed. Most of the 12,000 square feet of space added will be devoted to an expanded die department. The company specializes in short-run stampings from metal, phenolics, etc.

Hauserman Boosting Output

E. F. Hauserman Co. is transferring some operations from its main plant at 6800 Grant Ave., Cuyahoga Heights, O., across the street to its new $1 million plant. The new plant contains facilities for roller levelling, shearing, painting and assembly of office panel type partitions and industrial partitions. Production of these units will be increased more than 20 per cent.

Scaife Observes 150th Year

Scaife Co., manufacturer of pressure vessels for air, gases and liquids, is building a $500,000 office building adjacent to its plant in Oakmont, Pa. It is scheduled to be completed in October. Erection of this building coincides with the 150th anniversary of the founding of the company.

Allis-Chalmers Names Agent

Allis-Chalmers Mfg. Co., Milwaukee, appointed Electrical Equipment Co. Inc., Davenport, Iowa, a dealer for its motors, control equipment, pumps and transformers in eastern Iowa and western Illinois. The company also named Utility Transformer & Equipment Co., Baraboo, Wis., a certified service shop for Allis-Chalmers transformers in that district.

Machine Tool Firm Expands

Work has begun on a new administration building, costing $500,000, for Lodge & Shipley Co., on a site adjoining the factory in Cincinnati. Shift of the administrative personnel to the new structure will release 14,000 square feet of floor space for expansion of machine tool manufacturing facilities.

Builds Pipe Plant in South

Erection of a plant that will manufacture prestressed concrete pressure pipe for the Atomic Energy Commission was completed at Columbia, S. C., by Lock Joint Pipe Co., East Orange, N. J.

Fabricator Expands Plant

Baltimore Steel Co., Baltimore, fabricator of structural steel and ornamental iron work, is erecting a fabricating building as an addition to its North Point Road plant. S. Raymond Machen is president.

Western Leases Building

Western Electric Co., Point Breeze, Md., leased a manufacturing building of about 280,000 square feet, at Laureldale, Pa. This will be set up and operated by the Point Breeze plant to produce electronic devices. A. Pope Lancaster is works manager at the Point Breeze plant.

Oil-Rite Corp. Moves

Oil-Rite Corp., manufacturer of lubricating equipment, moved to larger quarters at 2318 Waldo Blvd., Manitowoc, Wis.

Enters Guided Missile Field

A Guided Missile Products Division was established by Beckman & Whitley Inc., San Carlos, Calif., instrument-engineering organization. Initial emphasis will be directed towards design consultation and manufacturing of explosive-actuated devices such as: Safety destructors, security destructors, guillotine destructors,

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Steel Mfg. Opens New Office

Steel Mfg. & Warehouse Co., which suffered extensive damage in the July flood, is occupying its new office and warehouse buildings at 1449 Genesee St., Kansas City, Mo.

Dresser Consolidates Units

Stacey Bros. Construction Co., Cincinnati, becomes the Stacy Division after consolidation with Columbus Division of Dresser Equipment Co. and will continue on present production policies with same personnel. Eric A. Flaschar, head of the Cincinnati concern, continues as president of the consolidation. Both factories are controlled by Dresser Industries.

Westinghouse Buys Building

Westinghouse Electric Co., Baltimore, acquired a building at Eagle and Smallwood streets, for the installation of its induction heating laboratory, which is now located in smaller quarters at its Wilkens avenue plant. The space thus made available in the main plant will be equipped for manufacture.

Borg-Warner Forms Division

Borg-Warner Corp., Chicago, established a Products Development Laboratory at 8651 E. Seven Mile Rd., Detroit, as a separate division entrusted with responsibility for carrying both defense and civilian items from the invention stage to actual production. Development of new products for war use and the improvement of automatic transmissions are the projects which are being given priority by the staff of more than 50 engineers, designers and other technicians at work under the direction of David T. Sicklesteel, general manager of the laboratory.

Incorporation Papers Filed

Firms which filed charters of incorporation with the secretary of state's office in Dover, Del., and for which Corporation Trust Co., 100 W. Tenth St., Wilmington, Del., is serving as principal office are: Jasco Steel Products Co., iron and steel; Heckett International Inc., iron and steel; Steel Framing Products Corp., steel products; Mercury Metal Finishing Corp., metals; Wallace Companies of Wisconsin Inc., tubing and pipe; Wallace Companies of North Carolina Inc., piping; S. D. M. Co., machinery. Firms filing charters and listing machinery as their principal business, with Prentice-Hall Corporation System Inc., Dover, acting as principal office, are: National Phoenix Industries Inc. and Mohr Supply Co.

Utility Plans Big Expansion

Consolidated Gas Electric Light & Power Co., Baltimore, will spend $28 million this year for expansion of plant and facilities. This figure includes only such work as is expected to be completed this year.

Clark Building Addition

Clark Machine & Welding Co. Inc., Baltimore, is erecting an addition which will be used for offices and repair work.

Foster Leases Machine Shops

Foster Wheeler Corp., New York, is leasing a major portion of the Vulcan Iron Works in Wilkes-Barre, Pa. Vulcan will operate the machine shops under subcontracts from Foster Wheeler and other companies.

Nut, Equipment Firms Merge

Elastic Stop Nut Corp. of America, Union, N. J., merged with American Gas Accumulator Co., Elizabeth, N. J. American Gas will be operated as a division of ESNA and will continue to manufacture aviation ground lighting equipment, automatic aids to marine navigation, time-delay relays, traffic signs and signals.

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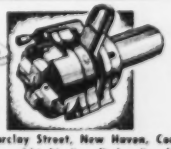

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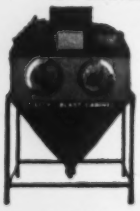

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Abbott Ball Co., The 180
Accurate Perforating Co. 182
Aeroquip Corporation 93
Air Reduction 28
Ajax Electrothermic Corporation 21
Ajax Engineering Corp. 141
Allied Research Products, Inc. 97
American Optical Co. 30
American Screw Co. 35, 186
American Shear Knife Co. 174
American Wheelabrator & Equipment Corp. 112, 113
American Zinc, Lead & Smelting Co. 170
American Zinc Sales Co. 170
Arcos Corporation 128, 129
Associated Spring Corporation 31
Atlantic Screw Works, Inc. 35
Atlas Car & Mfg. Co., The 140

Babcock & Wilcox Co., The, Refractories Division 88
Barnes-Gibson-Raymond, Division of Associated Spring Corporation 31
Barnes, Wallace, Co., Division of Associated Spring Corporation 31
Barnes, Wallace, Co., Ltd., The, Division of Associated Spring Corporation 31
Behr-Manning Corporation, Division of Norton Co. 110, 117
Belmont Iron Works, The 185
Bethlehem Pacific Coast Steel Corporation 1
B. G. R. Cook Plant, Division of Associated Spring Corporation 31
Black & Decker Mfg. Co., The 148
Blake & Johnson Co., The 35
Blaw-Knox Co., Lewis Foundry & Machine Division 111
Bliss & Laughlin, Inc. 20
Bolardi Steel Corporation 183
Boston Woven Hose & Rubber Co. 143
Braeard Steel Division, Sharon Steel Corporation 120
Bryant Chucking Grinder Co. 17, 18
Buffalo Forge Co. 106
Cameron Screw & Mfg. Corp. 35, 107
Carpenter Steel Co., The 22
Central Screw Co. 11, 35
Cincinnati Milling Machine Co., The 57
Cleaning Machine Corporation 154
Cleveland Crane & Engineering Co., The, Cleveland Tramrail Division 122
Cleveland Steel Tool Co., The 184
Cleveland Tramrail Division, The Cleveland Crane & Engineering Co. 122
Cleveland Twist Drill Co., The 24
Clinton Machine Co., Warner Division 118
Colorado Fuel & Iron Corporation, The, Wickwire Spencer Steel Division 131
Continental Screw Co. 35
Continental Steel Corporation 25
Cowles Tool Co. 183
Cro-Plate Co., Inc., The 92
Cross Co., The 21
Crucible Steel Casting Co. 183
Curtis Pneumatic Machinery Division of Curtis Manufacturing Co. 27

Drop Forging Association 119
Dunbar Brothers Co., Division of Associated Spring Corporation 31

Eagle Lock Co., The 35
Eastern Machine Screw Corp., The 185, 187
Eastman Kodak Co. 127
Easton Car & Construction Co. 150
Economy Engineering Co. 180
Elco Tool & Screw Corporation 35
Electro Metallurgical Co., A Division of Union Carbide & Carbon Corporation 158
Electro Refractories & Abrasives Corporation 108
Engineering & Construction Division, Koppers Co., Inc. 36, 37
Erie Foundry Co. 24
Euclid Crane & Hoist Co., The 94
Eureka Fire Brick Works 180

Farrel-Birmingham Co., Inc. 98
Federal Machine & Welder Co., The 134
Fellers Co., The 12

Gates Rubber Co., The 151
Geometric Stamping Co. 146
Gerrard Steel Strapping Division, United States Steel Co. 126
Gibson, William D., Co., The, Division of Associated Spring Corporation 31
Gisholt Machine Co. 15
Gordon, Claud S., Co. 178
Gray Iron Founders' Society, Inc. 184
Great Lakes Screw Corporation 35
Great Lakes Steel Corporation 60

Hamilton Tool Co., The 102
Harper, H. M., Co., The 15
Hartwell Brothers 184
Haynes Stellite Co., A Division of Union Carbide & Carbon Corporation 145
Hinde & Dauch 142
Holcroft & Co. 124
Horsburgh & Scott Co., The 126
Hydraway Scales, Inc. 181

Industrial Brownhoist Corporation 119
Industrial Products Suppliers 182
Inland Steel Co. 46
International Nickel Co., Inc., The 42
Iron & Steel Products, Inc. 186

Jones & Laughlin Steel Corporation 101

Kearney & Trecker Corp. 23
Keokuk Electro-Metals Co. 95
Keystone Steel & Wire Co. 10
Kold-Hold Mfg. Co. 184
Koppers Co., Inc., Engineering & Construction Division 36, 37
Krause Stamping & Mfg. Co. 182

Lamson & Sessions Co., The 35
Latrobe Electric Steel Co. 63
Lavalino & Ide, Inc. 67
Layne & Bowler, Inc. 100
Lewinson Steel Co., The 88
Lewis Foundry & Machine Division of Blaw-Knox Co. 111
Lewthwaite, T. H., Machine Co., Inc. 184
Lincoln Electric Co., The 45
Linde Air Products Co., A Division of Union Carbide & Carbon Corporation 8, 9
Logan Co. 88

McKay Co., The 105

Mackintosh-Hemphill Co. 137
Magnuson, F. N., & Sons Co., Division of Associated Spring Corporation 31
Marchant, Geo. F., Co. 150
Master Electric Co., The 29
Mathews Conveyer Co. 1-8
Mattison Machine Works 34
May-Fran Engineering, Inc. 85
Mesta Machine Co. 58
Mettler Machine Tool, Inc. 94
Miller & Co. 95
Milwaukee Division of Associated Spring Corporation 31
Motch & Tool Co., The 184
Moto-Truc Co., The 130
Mystik Adhesive Products 182

National Lock Co. 35
National Screw & Mfg. Co., The 35
National Steel Corporation 60
Nicholson File Co. 133
Nilson, A. H., Machine Co., The 115
Northern Engineering Works 110
Norton Co., Behr-Manning Corporation Division 110, 117

Ohio Crankshaft Co., The 2
Ohio Division of Associated Spring Corporation 31
Ohio Locomotive Crane Co., The 184
Ohio Seamless Tube Co., The 103
O'Neil-Irwin Mfg. Co. 177

Pangborn Corp. 188
Parker-Kalon Corporation 35
Pheoll Manufacturing Co. 35
Pioneer Engineering & Manufacturing Co., Inc. 100
Pittsburgh Coke & Chemical Co. 109
Poole Foundry & Machine Co. 185
Public Service Electric & Gas Co. 133

Quickwork Division, Whiting Corporation Inside Front Cover

Raymond Manufacturing Co., Division of Associated Spring Corporation 31
Reading Crane & Hoist Corporation 177
Reed Engineering Co. 182
Reliance Electric & Engineering Co. 5
Republic Steel Corp. 16
Rockford Screw Products Co. 35
Roebling's, John A., Sons Co. 19
Rogers, Dayton, Manufacturing Co. 184
Russell, Burdsall & Ward Bolt & Nut Co. 64
Ryerson, Joseph T., & Son, Inc. 38

St. Joseph Structural Steel Co. 187
Sandvik Steel, Inc. 153
Scovill Manufacturing Co. 35
Screw Research Association 35
Seaboard Steel Co., Inc. 186
Security Locknut Corporation 123
Shakeproof, Inc. 35
Sharon Steel Corporation 7
Shimer, Samuel L., & Sons, Inc. 184
Simonds Saw & Steel Co. 14
Socony-Vacuum Oil Co., Inc. 32
Southington Hardware Mfg. Co., The 35
Standard Conveyor Co. 136
Stanley Works, The 178
Sterling Bolt Co. 35, 142
Stronghold Screw Products, Inc. 35
Stuart, D. A., Oil Co., Ltd. 184
Sun Oil Co. 98, 99
Superior Steel Corporation 87

Tennessee Products & Chemical Corporation 4
Thew Shovel Co., The 144
Timken Roller Bearing Co., The Back Cover
Toledo Stamping & Manufacturing Co. 184
Torrington Co., The 169
Towmotor Corporation 33

Union Carbide & Carbon Corporation, Electro Metallurgical Co. 158
Union Carbide & Carbon Corporation, Haynes Stellite Co. 145
Union Carbide & Carbon Corporation, Linde Air Products Co. 8, 9
United Screw & Bolt Corporation 41
United States Steel Co. 138
United States Steel Corp., Subsidiaries 138, 178
United States Steel Supply Division, United States Steel Co. 138
United Wire & Supply Corporation 179

Van Huffel Tube Corporation 13
Veeder-Root, Inc. 3
Verson Allsteel Press Co. 132

Wales-Beech Corporation 35
Ward Steel Co. 180
Warner Division, Clinton Machine Co. 118
Washington Steel Corporation 91
Wells Manufacturing Corporation 144
Werner, R. D., Co., Inc. 6
Westinghouse Electric Corporation 26
Wheeling Steel Corporation 185
Wheland Co., The 180
Whiting Corporation, Quickwork Division Inside Front Cover
Wickwire Spencer Steel Division of The Colorado Fuel & Iron Corporation 131
Wilkie Die Products Co. 186
Wilson Products, Inc. 171
Wilson, Lee, Engineering Co., Inc. Inside Back Cover
Winsmith, Inc. 152
Wolverine Tube Division 125
Worcester Pressed Steel Co. 157
Worcester Stamped Metal Co. 175
Wyckoff Steel Co. 118

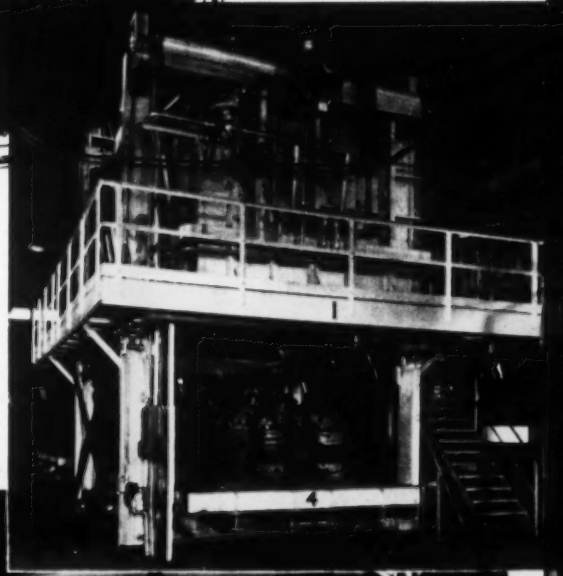
Yoder Co., The 23

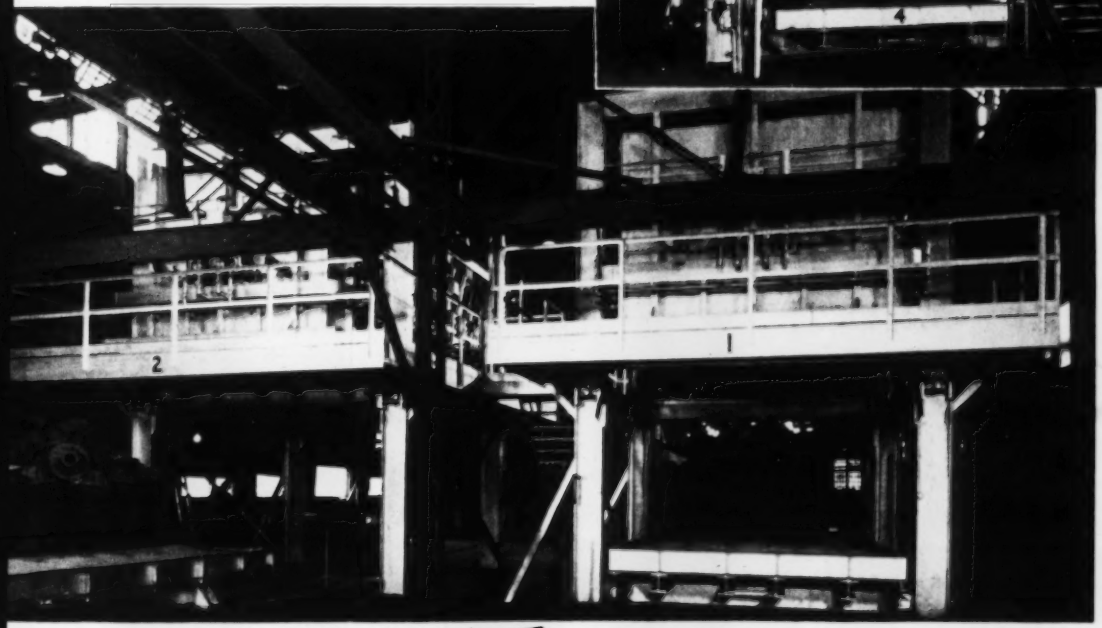
Zeh & Hahnemann Co. 184

Table of Contents Page 5
Classified Advertising Pages 186, 187

WILSON MALLEABLEIZING FURNACES

THE two elevator type bell furnaces and four bases have just been installed in a large midwest malleable iron plant. Charge size: 76" x 220" - 66" high. Furnaces heated with "O" type radiant tubes.





Lee Wilson ENGINEERING Co., Inc.

20005 WEST LAKE ROAD • CLEVELAND, OHIO
Telephone ED-1-6600

BELL TYPE FURNACES ★ RADIANT TUBE HEATING ★ ANNEALING PROCESSES

Less scuffing and scoring in Sendzimer mill with TIMKEN® bearings as back-up rolls

THE Superior Steel Corporation has a total of 54 Timken® tapered roller bearings as back-up rolls in their Sendzimer mill which is used for the cold reduction of high tensile and stainless steels. The Timken bearings used in this application are of a special design in which the outer race of the bearing is the back-up roll.

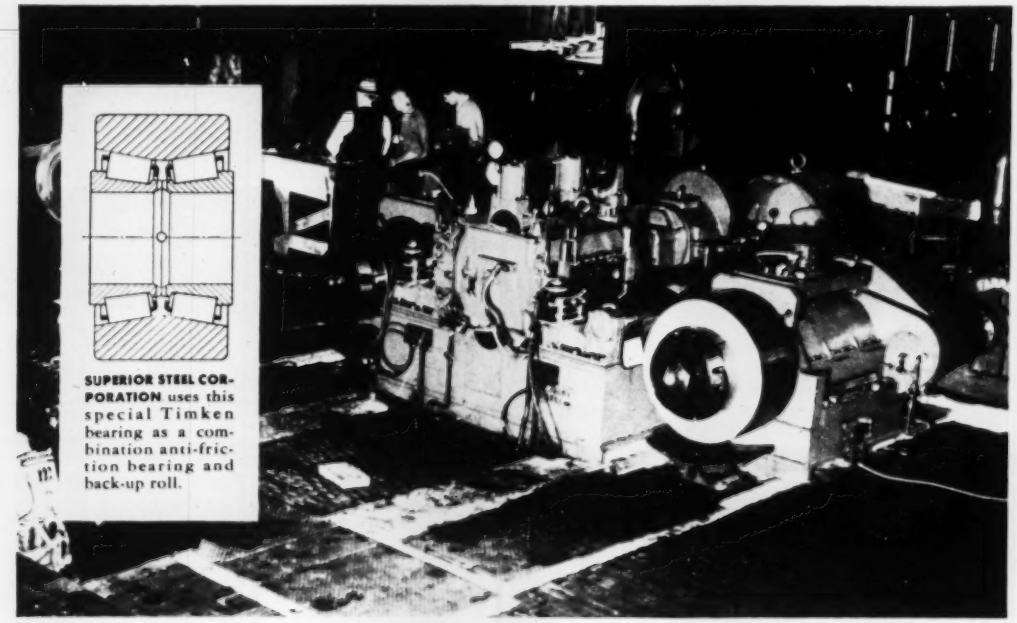
Timken bearings as back-up rolls reduce end-movement. Thrust washers are unnecessary. Due to the tapered construction of rollers and races, Timken bearings carry both radial and thrust loads in any combination. The O.D. of the outer race has a surface finish of fifteen micro-inches. As a result, scuffing and scoring of the back-up rolls and associated rolls are minimized—and there's less chance of marking the high quality finish stainless steel strip.

The incredibly smooth surface finish and true rolling motion of Timken bearings practically eliminate friction. What's more, Timken bearings provide extra load-carrying capacity due to line contact between rollers and races.

The extra heavy races of the Timken bearings in this application give maximum support. Since they are the back-up rolls, they simplify design.

No other bearing can give you all the advantages you get with Timken tapered roller bearings. Look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



SUPERIOR STEEL CORPORATION uses this special Timken bearing as a combination anti-friction bearing and back-up roll.

GREATER LOAD AREA

Because the load is carried on the *line* of contact between rollers and races, Timken bearings carry greater loads, hold shafts in line, wear longer.

The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special analysis steels.

TIMKEN

TAPERED ROLLER BEARINGS

NOT JUST A BALL — NOT JUST A ROLLER — THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION